

good metalled road. The Bussala oil spring is 11 miles by road from Rawalpindi, two miles and a half of which are a bridle path, the rest nearly or quite passable to carts. The Loondeegar asphalt is 16 miles by road from Rawalpindi, about six miles a mere bridle path, the rest passable for carts. The Gunda wells are about 30 miles by a wagon road, mostly good, from Rawalpindi. The Punnoba oil springs are 87 miles by road from Rawalpindi; the dozen miles next the springs are not passable for carts, but the rest are. The Aluggud asphalt is 145½ miles by road from Rawalpindi, of which distance about 10 miles are quite impassable for carts, but the rest is nearly or quite passable for them. The Chhota Kutta and Burra Kutta (Jaba) oil springs are 102 miles by road from Rawalpindi, the first dozen miles or so quite impassable for carts, and the rest perhaps so in places. If the hire of a camel be taken as eight rupees a month, and his load 50 gallons of oil and a march as about a dozen miles, the carriage of a gallon of the oil by camels from each of these places would at least cost as follows:—Rutta Otoor and Bussala, 2½ pies; Loondeegar, 3 pies; Gunda, 7½ pies; Punnoba 1 anna 5½ pies; Chhota Kutta and Burra Kutta (Jaba), 1 anna 7½ pies; Aluggud, 2 annas 3½ pies.

6.—REPORTS AND MAPS.

A special report has been written upon each of the places where oil, tar, or asphalt is found, and geological and topographical maps have been made for the Rutta Otoor, Bussala, Loondeegar, Gunda, Chhurrut, Boraree, Dulla, Punnoba, Aluggud, Chhota Kutta, and Burra Kutta oil lands. It was not thought worth while to map the other places, and even some of these derive their chief importance much less from their own merits than from the boring and digging that were formerly done at them.

The report for each place treats specially of the situation; the lay of the land; the geology, both the structure and the rock beds; the oil, its mode of occurrence, yield, outcrop and working; salt, sulphur or any other minerals found near the oil; the shipment; and finally, the books and papers that speak of each place. The aim has been to make the reports as full as may be, without giving needless and confusing details, and to give not only the observed facts, but the inferences drawn from them without, however, giving mere inferences as observed facts. All the reports, though final, have by requirement been wholly written in the jungle, as it were, and are therefore defective of course in some points where a reference to books and collections would be needed.

The maps of the Gunda, Chhurrut, Aluggud, Chhota Kutta, and Burra Kutta oil lands are based upon a rough survey; the others, mostly less important, are based upon a very rough survey, and are therefore called mere sketch maps. Each map shows a space of half a mile square with the oil springs in the centre, and by the side of the map are given an upright section of the rock beds and a long section of the basins and saddles. The maps are all on a scale of $\frac{1}{1250}$ or 500 feet to an inch, and show the shape of the ground by contour lines 10 feet apart in level, and the position of the oil-bearing bed of rock by what may be called its contour lines 100 feet apart in level, and the outcrop by a hatched line. The observed dips are shown by arrow heads, and the number of degrees attached. The basin section is on the same scale as the map, and with the same vertical as horizontal scale, so as not to distort the structure. The rock section is on a scale of $\frac{1}{1250}$ or 100 feet to the inch, so as to make it possible to show a bed of one foot in thickness, or even less. The aim has been to make the maps as full and as independent of the reports as possible, and, as in the reports, to state as fully as consistent with clearness, not only the observed facts, but also the inferences drawn from them; yet in such a way that the two classes of statement should not be confounded. The mere guess of one who has been on the ground and carefully studied the matter is of value to those who have not been there, provided it be given as a guess, and not as a positive observation. At the same time, if the original observations are truly given, nothing prevents others from drawing their own inferences independently of the observer's inferences.

Of course the rougher the survey has been, the less trustworthy in intricate cases will the inferences be; but that is indicated by the very title of the map ("sketch map" or "map of a rough survey"). In the maps in question it would not have been worth while to make the survey very minute and time-taking, because what is chiefly wanted is a guide in beginning borings, or a proof of the general nature of the geology and structure of the place. They will show not only the probable general course of the outcrops and underground position of the oil-bearing beds, that is, where to look for them, but will show where borings can best be begun. The errors of these indications are in general likely to be greater the farther a point is from the oil springs themselves: but for other reasons it is desirable to bore at first quite near to the springs, so that the errors are of less importance. The borings themselves as they advance will give more and more exact knowledge of the position of the oil-bearing bed. The maps indeed are not intended as finally accurate statements of the geology, but rather as guides to finding it out, and something on which to base the corrections furnished by further explorations.

7.—BOOKS AND PAPERS.

The Punjab oil springs are spoken of in a "Report on the Salt Range," by Doctor Andrew Fleming, *Journal of the Asiatic Society of Bengal*, Volume XVII, No. 23, November 1848, page 517; in a "Report on the Structure and Mineral Wealth of the Salt Range," by Doctor Andrew Fleming, *Journal Asiatic Society, Bengal*, Volume XXII, 1853, No. 3, pages 264 and 265, No. 4, page 347; in "Notes on the Geology of the Punjab Salt Range," by W. Theobald, junior, *Journal Asiatic Society, Bengal*, Volume XXIII, No. 7, 1854, page 669; in a "Memorandum on Petroleum in the Rawalpindi Division," by Colonel R. Mac-lagan, R.L., Secretary to the Punjab Government, Public Works Department, Supplement to the *Punjab Government Gazette*, 5th February 1862, pages 23, 28; in a "Memorandum on the Results of a Cursory Examination of the Salt Range, and parts of the Districts of Runnoo and Kohat, with special view to the mineral resources of these Districts," by Thomas Oldham, D.D., Superintendent of Geological Survey of India, Calcutta, April 1864, reprinted in a Supplement to the *Gazette of India*, 24th August 1867, page 780; in a "Report on Petroleum Operation," by A. Fenner, Assistant Engineer, Proceedings of the Government of Punjab, Public Works Department, 17th June 1866, about five pages; in a "Letter on the Gunda Oil," by Doctor T. E. B. Brown, Chemical Examiner, Supplement to the *Punjab Government Gazette* for 7th February 1867 (about six pages of foolscap manuscript); in a paper on the "Geology of Cashmere, the Western Himalaya, and Afghan Mountains," by Doctor A. M. Verchère (or Verchere), *Journal Asiatic Society, Bengal*, Part II, No. 1, 1867, page 13; in a manuscript Memorandum, No. 220, by Major C. H. Hall, Deputy Commissioner, 5th February 1868, on file in the Public Works Department at Lahore, one page; in a "Report on Borings for Petroleum," by A. Fenner, Executive Engineer, Proceedings of the Government of Punjab, Public Works Department, July 1869, pages 2-6; in a manuscript "Report on the Jaba Petroleum Springs near Kalabagh," by Lieutenant J. A. Armstrong, Executive Engineer, December 1869, on file in the Public Works Department at Lahore, pages 1-4; in a "Note on the Petroleum Locality of Sudkal," by A. B. Wynne, F.G.S., Geological Survey of India, Records of the Geological Survey of India, Volume III, No. 3, 1870, pages 73-74; and in a manuscript Report of his last winter's field work in the Salt Range, by A. B. Wynne, F.G.S., Geological Survey of India, on file in the Office of the Geological Survey of India at Calcutta, 1870

Report on the Rutta Otoor Oil Lands, Rawalpindi District, Punjab, accompanied by a Geological and Topographical Sketch Map, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The Rutta Otoor oil spring is 11 miles north by east from Rawalpindi, and 350 yards north of the hamlet of Rutta Otoor.

2.—LAY OF THE LAND

The hamlet lies upon a small brook called the Kutta, just in a gap in the most southerly of the several parallel ranges of high hills or mountains that border the Rawalpindi District on the north next to the Hazara District. The general course of the first range is north-easterly and south-westerly, while the brook here runs for some distance nearly due south. East of the hamlet the ridge is divided in two by a long hollow, with two or three smaller branches. At the northern foot of the northern half of the range, and about 100 yards east of the brook, is the oil spring on the northern bank of a small branch of the brook, about 2,000 feet above the sea. A little more than a quarter of a mile north of the spring is another high ridge, likewise cut through by the brook; and the space between that ridge and the first is pretty flat for a width of say 100 yards near the brook, but rises easterly and westerly to high hills.

3.—GEOLOGY.

a. Structure.—The rocks seem to form a saddle to the north of the oil spring, and a basin to the south of it, with a southerly dip of about 50' near the spring, a southerly one of about 85' at the hamlet, and a northerly one of about 88' some 50 yards south of the hamlet. It is probable that the axis of the saddle is not far north of the spring, perhaps 100 yards; and that the axis of the basin is at the southern edge of the hamlet.

b. Rock Beds.—The only rocks exposed about the spring and near the hamlet are a dark gray lime rock, with nummulites and other fossils, belonging therefore to the nummulitic formation. It is probably the same as the so-called nummulitic lime rock of the Salt Range, in which the Kutta oil springs near Jahn occur. There are probably here and there layers of gray or light brown shales between the layers of lime rock. The thickness of this lime rock, including the shales that go with it, must be at least 750 feet. Scarcely 200 yards southerly from Kutta Otoo on the road to Shah-ka-Noorpoor is exposed a gray slightly reddish sand rock that dips about 15' north-westerly, seeming to pass under the lime rock just mentioned, and 20 yards further south a similar sand rock contains a six-inch layer of reddish and gray sandy lime rock. This sand rock belongs probably a short distance above to the Gunda group of rocks, and would in that case be also of nummulitic age. Indeed, reddish, gray and red shales are exposed a mile or two south-east of Noorpoor that look extremely like some of the rocks near Gunda.

4.—OIL AND ASPHALT.

a. Mode of occurrence.—At the oil spring scarcely any digging at all has been done; the earth has merely been scooped out of a hole some two feet long and six inches wide, and at most some nine inches deep. This hole is commonly filled with water from a natural spring, and a thin layer of dark green oil rests upon the water, and flows very slowly away. The oil seems to come from the cracks of a bed of the lime rock, perhaps 15 feet thick, at a distance of some 250 feet above the highest sand rock. In the bed and sides of the small water-course, about 40 yards below the oil spring, is some asphalt, partly in the wash, and partly in the cracks of the lime rock. It is merely dried oil that once flowed here from the cracks of the rock, as it still does at the spring. The heat of the sun softens it sometimes, and changes it into a black tar.

b. Yield.—The oil of the spring, if gathered every day, would amount perhaps to half a pint a day, perhaps even less. The asphalt extends for some two yards in length, with an average width of perhaps one yard and thickness of six inches, and amounts therefore to about a third of a cubic yard, and would weigh perhaps half a ton, as it is impure with earth.

c. Outcrop.—The outcrop of the oil-bearing bed of lime rock runs probably north-easterly and south-westerly from the spring and asphalt exposure, in a direction not far from straight, but bending round a little towards the north on account of the rise of the ground, combined with the south-easterly dip of the bed. Some 200 yards north of the spring would perhaps be found the corre-

sponding outcrop of the same bed on the north-eastern side of the saddle, and it would likewise run north-easterly and south-westerly, with a corresponding southerly bend on either hand. Some 200 yards south-east of Rutia Otoo there would probably be another outcrop of the oil-bearing bed, with a course nearly parallel to the one of the springs. As these outcrops run along the hill-sides for long distances, and would no doubt give rise to the oil springs here and there if it continued to contain oil, it is probably quite barren of oil (beyond perhaps a trace of bitumen) except close about the spring.

d. Working.—In making borings, then, it would be advisable to make them at first very near the spring or asphalt. By boring south-easterly from the spring or asphalt the oil-bearing bed would be found at greater and greater depth, the greater the distance from those points. This depth would probably be 100 feet below the level of the spring for a distance from it of say 80 feet; 200 feet at a distance of 150 feet; 300 feet at a distance of 200 feet; 400 feet at a distance of 240 feet; 500 feet at a distance of 270 feet; and so on, growing rapidly greater until a depth of 1,000 feet is reached at a distance of about 350 feet. Of course, for the depth from the surface of the ground at any of these points, the height of that point above the level of the oil spring must be added to the depths just given. It would not be best to bore at first where the oil-bearing bed would be more than from 50 to 100 feet deep from the surface; and the result of the boring would be an additional guide, not merely as to the prospects of a deeper boring, but as to the dip and consequent probable position of the bed at greater depth. The yield of the spring at present would seem, on the whole, small as it is, to justify the Government in making the experiment of a boring not more than 50 or 100 feet deep.

5.—SHIPMENT.

In case oil should ever be found here in quantity, it could be carried on the backs of camels or other animals by a narrow bridle-path to Shah-ka-Noorpoor, one mile distant, and thence by a good unmetalled wagon road four miles to the Rawalpindi and Murree big road, and then on an excellent metalled road eight miles to Rawalpindi, making in all thirteen miles.

Report on the so-called Oil Spring in the Cheerpar Mountain, Rawalpindi District, Punjab, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The so-called oil spring in the Cheerpar Mountain, discovered by Udind Moosulloo, is three-quarters of a mile south-west of the village of Musrot, which is a mile and a half south of Ruameel, a village on the Tullagunge road, six miles and a quarter south-west of Rawalpindi; in all therefore eight miles south-west of Rawalpindi.

SO-CALLED OIL.

a. Mode of occurrence.—The first Cheerpar Mountain (the most north-westerly of three or four) in its upper parts is very thin, and consists of yellowish brown sand rock, dipping about 80° south-easterly. At the point where the oil is said to be found, half-way up the steep, almost vertical southern side of the mountain, about 70 feet above the little plain below, there is, along a cleavage plane, a horizontal cave, in some places as much as six feet deep from the face of the rock and three or four feet high. It is said that in the hottest season, say in June or July, oil drips down from the roof of this cave, and forms white stalactites, six or eight inches long; but through the rest of the year, as at the time of this survey, there is nothing of the kind to be seen. In the rock of the roof there are three or four small dark discolored patches which seem to yield the oil. The largest one is of irregular shape, but at most about two yards long north-east and south-west, and two feet wide; and another two yards south-west of that is about two yards long by one foot wide, and has a still narrower spot alongside of its south-western end, and about a foot from it.

The white substance of the stalactites described is probably natural paraffine, which melts in the great heat of mid-summer and drips from the rock. The rock probably belongs to the age of the middle of the Gunda group, that is nummulitic.

d. Working.—The amount to be obtained from so small a deposit as this seems to me would be far too little to justify any expense in the way of further explorations, such as boring or digging. It seems in fact to be confined to the dark-colored patches just described, and the chances of hitting upon other like patches by digging or boring into the rock below are extremely small, and the likelihood of hitting upon a larger deposit of the kind there is still smaller.

Report on the Bussala Oil Lands, on the Seel River, Rawalpindi District, Punjab, accompanied by a Geological and Topographical Sketch Map, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The oil spring on the Seel River at the mouth of the Bussala in the Rawalpindi District of the Punjab is 10 miles and a half south-west by west of Rawalpindi, and one mile and three-quarters east of Moorut village.

2.—LAY OF THE LAND.

Both banks of the Seel and of the Bussala (here some 1,500 feet above the sea) are very steep, and much gullied with many precipices. Back from these the land lies nearly flat, rising to a height of 100 or 125 feet from the beds of the rivers; but it is broken up in many directions by the steep-sided gullies of the smaller streams, and to the north-east are two or three small chains (two or three miles long) of low hills rising above the general level.

3.—GEOLOGY.

The older beds of rocks near the spring all dip about 75° south-eastedly, with a strike of north 57° east; but the newer rocks rest upon these quite unconformably, and are nearly level or quite so.

These newer rocks are of older alluvial age, and consist at the top of a very much contorted concretionary lime rock or travertine, full of irregular holes and of hollow tubes, probably broken fossil stems of plants, and of fossil leaves; and this rests possibly here, as it clearly does elsewhere within three miles, on a very coarse pebble rock with pebbles of fist size or larger. The travertine is exposed on the eastern bank of the Bussala about 100 yards above the mouth in a cliff some eight feet high. The pebble rock is exposed on the east bank of the Seel about 60 yards above the mouth of the Bussala, and is from nothing up to three feet in thickness according to the erosion that had taken place in the underlying rocks before the deposition of the pebble rock. The cliffs, some 40 feet high along the banks of the two rivers, seem to consist mainly of a soft yellowish brown sand rock that rests immediately upon the coarse pebble rock where this is exposed. At the crossing of the Seel, about two miles north of this place, near the village of Tulhesun, the concretionary limestone to the thickness of 100 feet or so is seen resting upon the coarse pebble rock; and this about three feet thick, upon the soft brown sand rock which reaches to the water's edge—all of these with no dip or nearly none above steeply dipping rocks in the beds of the river. It is likely therefore that there are at least two layers of pebble rock, one between the travertine and soft sand rock and not seen at the oil spring, the other below the sand rock.

The older rocks at the oil spring are probably of the nummulitic formation, of the same age as the Gunda group; and the following section was noticed

there on the east bank of the Seel, about 60 yards north-east of the spring. Downward—

Shales	about 5 feet.
Limy sandy shales	" 8 "
Blue sandy, clayed, and (limy?) shales, with a thin layer of lime rock near the bottom like the next	" 15 "
Bluish gray lime rock, broken up into thin cross cleavage layers, nearly at right angles with the bedding	" 12 "
In all	about 40 feet.

The oil would seem to come from the blue shales. About 100 yards up the Russala from its mouth there is a thin layered, almost slaty, light brown sand rock with a like dip, which must be therefore about 350 feet below the section just given, and on one of its blocks are a few spots of black, as if some body had spilt some tar there. It was pointed out as a deposit of mineral tar, but would seem not to be a natural one, nor to have the least importance in any case.

4.—OIL.

a. Mode of occurrence.—The oil rises up through the extremely shallow water of the river; one drop at a time every minute or two gives rainbow colors to the surface of the river for the space of a few inches, then floats away and disappears. At a distance of about 20 yards north-easterly, apparently on the outcrop of the same bed of shales, is another like show of oil; also at one or two other places between these extremes.

b. Yield and working.—The whole yield is plainly very small indeed, at most say a gill a day,—too little probably to justify any boring to test the bed, especially as this at its exposure on the bank close by seems to be quite barren of oil. Still it may at some time be thought worth while (more particularly on account of the nearness of Rawalpindi) to test the same bed at some little depth, and in that case it is clear where borings should be made. As this and other deposits of the kind in this Province seem to be of but very limited extent, perhaps a few yards only, it would not be well to make the first boring very far from the points where the oil and gas are seen to rise. As the bed dips some 75° to the south, 33° east, it will be needful to go in this direction 28 feet and two-thirds only to bore upon the bed at a depth of 100 feet below the river level, twice that distance for 200, and so on. Of course the height of the boring site above the rivers should be borne in mind as adding to the depth of the boring. In this way the bed can be bored upon at any desired depth, and the bed can be tested at the same depth below water level in a north-easterly or south-westerly direction, bearing in mind that the strike is north 57° east, and going in that direction from the point found out as just described for any given depth.

5.—SHIPMENT.

The place is quite accessible, as it is only two miles and a half from the big road that passes through Tullheun south-eastward, and that road connects without any bad stream to cross with the Tullagung road south of Runneal. The only bad place in respect to carriage is up the steep, gullied river bank, close by the oil spring; but this could easily be improved, and is already quite passable to horses and camels. The oil spring is by the road three miles and three quarters from Runneal, and 11 miles from Rawalpindi.

Report on the Loondegar Oil Lands, near Moorut, Rawalpindi District, Punjab, accompanied by a Geological and Topographical Sketch Map, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The asphalt and oil places near the house called Loondegar, on the land of Goolab Shah, a Lumberdar of Moorut, Rawalpindi District, Punjab, are two miles and a half south-west by west of the main Moorut village, and 14 miles south-west by west of Rawalpindi.

2.—LAY OF THE LAND.

The two places are about 1,550 feet above the sea near the head-waters of some small streams that flow south-easterly into a brook that comes down from

the southern side of the Khairree Moorut, and empties into the Seel River, and are about half-way between the mountain and the river. The asphalt place is on a gently sloping hillside; and the oil place, a quarter of a mile south-west-erly of that, is on the bank of a small watercourse. Between the two is a ridge about 80 feet high, running north-west and south-east, and a couple of hundred yards north of the asphalt is a ridge of about the same height, running for some 300 yards east-north-easterly. North of that is a wide plain, and south of it the land is nearly flat, and slopes gently south-easterly. The land to the south-west of the oil place is also nearly flat, except where gullied by the small watercourse and its tributaries.

3.—GEOLOGY.

At the asphalt place the solid rocks are not at all exposed, so that the dip and strike are not to be seen, but at the oil place the strike is seen to be about north 55° east; and as the direction from one place to the other is the same, they are both probably on the outcrop of one bed. The dip at the oil place is about 85° north-westerly; but some 45 yards north of that, the dip, although in the same direction, is only about 60°. Some 10 yards still further north the rocks, with the same dip, are covered by a nearly or quite level bed of e-mer-sonary limestone or travertine, about two feet thick. This is plainly such tra-vertine as that on the Bussala River near its mouth, and therefore of older allu-vial age. The steeply dipping rocks are of the nummulitic formation (probably of the Gunda group), and many nummulites are to be found on the hillside east of the oil place. The rocks exposed at the oil place, and at 40 or 50 yards north of it, are all a coarse greenish gray soft sandstone, and it is the source apparent-ly of all the oil that has flowed at either place.

4.—ASPHALT AND OIL.

a. *Mode of occurrence and yield.*—The asphalt occurs in the form of bitu-minous earth, or earthy asphalt, plainly the product of a natural spring of oil that has in former times flowed here, and whose oil in drying has become solid, and remained mixed with sand and small pebbles. It has been dug into at one point to the depth of two feet and a half or three feet without coming to the bottom of it, and extends over a surface, roughly a triangle in shape, about 60 yards long, and about 1,000 square yards in surface extent. Taking its average thickness at a yard (and it seems to be fully that, though not yet properly tested by digging), the amount would be about 1,000 cubic yards. No test of its capacity to yield oil or gas seems ever to have been made, although it is said that 10 maunds of it were taken by Government agents to Rawalpindi some two years ago. By mere guess it would seem likely to yield to the cubic yard at least as much gas as half a ton of oil, that is to say, some 11,000 feet. The specific gravity of the asphalt has not been tested either; but as it is earthy, a cubic yard would weigh perhaps a ton and a half, certainly not more than two tons, and probably not less than one ton. The whole thousand cubic yards would weigh then about 1,500 tons.

The oil occurs at both places in extremely small quantity, but chiefly at the asphalt place, and is found only in the hot weather, evidently the effect of heat upon the asphalt at the one place, and on the bituminous rock at the other place. This bituminous rock seems to be of very small extent, a mere blotch in the coarse green soft sand rock, some 15 yards long (north-west and south-east) and three yards wide (north-east and south-west), and only exposed to a depth of two feet by a small trial pit. There are four other such oily spots in the rock close by, all small ones, varying from two feet to two yards long.

d. *Working.*—The proper place to bore, or dig, to test the yielding capa-city of the bed at any desired depth from the surface, is to the north-west ("to the dip") from either the asphalt or the oil place. As the bed dips at an angle of about 85° at the oil place, and perhaps at the same angle at the asphalt place, it will be needful to go only eight feet and three quarters to the dip to find the bed at a depth of 100 feet, or to go 17 feet and a half to find it at 200 feet, and so on. The bed at any such depth may be followed north-easterly or south-westerly by going in the direction of the strike, about north 55° east. There is, however, little or no encouragement to boring except close by the asphalt that seems to have come from a considerable deposit of oil in the rock which may not have been exhausted. It is plain that all such deposits in this

region are, like the small ones at the oil place here, quite limited in extent, and it is therefore not best to bore far from a spot where oil is known to occur. A well elsewhere sunk at random on the bed might possibly hit upon a good deposit, but the chances are very greatly against it.

5.—SHIPMENT.

The places are by a road passable to horses and camels, but hilly two miles and a half from Moorut village, which is three miles by a good bridle-path from Tulheem, and thence it is ten miles and a half by larger roads to Rawalpindi, or 16 miles in all. But it is only five miles from the asphalt and oil, over a pretty good country for making a road, to the Tallagung road at a point 10 miles and a half from Rawalpindi.

Report on the Gunda Oil Lands, Rawalpindi District, Punjab, accompanied by a Geological and Topographical Map of a Rough Survey, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The Gunda oil wells are on a tract of three acres and a half of land owned by the Government, about 100 yards west of the big road from Futteljung to Campbellpoor, and two miles and a half north-west of Futteljung, and are 23 miles slightly south of west of Rawalpindi. They are one mile south-south-east of Ajoowal, and one mile and three furlongs north-west of Sukal, and have by different writers been called by the name of each of these villages.

2.—LAY OF THE LAND.

The wells, about 1,700 feet above the sea, lie in the middle of a plain about 300 yards wide north and south about 100 yards on the west from the head of a small stream flowing westward into the Bugwan, and 100 yards on the east from the head of another small stream flowing eastward and north-eastward to the Nundna. This plain is separated on the south by a ridge about 15 feet high from the wide plain that reaches several miles west of Futteljung. On the north are three ridges, the highest some 40 feet above the wells, within about 300 yards between the little plain and the valley in which lies the village of Ajoowal. Easterly from the wells for half a mile the ground is little broken and slopes gently, but westward it is much broken by hills, rising 30 feet or so above the wells, and narrow valleys some 75 feet below the level of the wells.

3.—GEOLOGY.

a. Structure.—The little plain of the wells lies in a basin of the rocks which seems to extend for several miles both easterly and westerly. The first ridge north of the well is formed by a saddle in the rocks, but seems to lie within the main basin, which is bounded rather by the rock saddle of the double ridge about 200 yards further north. The low ridge south of the wells seems to be composed of two or three chains of rock saddles, but to be in the main the northern half only of a large saddle, having the general dip of its rocks northerly. Subordinate to this main structure are many small saddles and basins, the larger ones in general parallel to each other and to the main basin, but the smaller ones filling up the spaces between each other and the larger ones with great variety and apparent irregularity in their directions. The general course of the main basin seems to be about north 80° east, but that of the larger of the small basins seems to be north 70°, or only 60° east. The dip is often quite steep, often in fact reversed (as far as 70°), and is seldom less than 45°. Owing to this, and the fact that there are so many small basins and saddles with various directions, it is very hard to form a good opinion as to the precise place of any given bed in almost any place where the rocks are unexposed for a few yards. But in the central part of the basin the rocks are somewhat less disturbed and irregular than at the sides.

b. Rock Beds.—The rocks that share the structure just described belong to the nummulitic formation, and are the only ones that are clearly in place within

200 yards of the oil wells. But a little more than a quarter of a mile south-west of them are exposed some rocks, probably of older alluvial age, lying nearly level upon steeply dipping nummulitic rocks, and capping the hills on the northern edge of the great plain. These rocks, of alluvial age, are a brown pebble rock, with pebbles of walnut and tilbert size, some 10 feet thick, covered by a coarse concretionary light buff (but weathering dark bluish gray) limestone or travertine, full of irregular holes, perhaps five feet exposed. Many blocks of this same limestone are scattered on the hill tops between that and the wells, and in some places are seen also traces of the pebble rock, and some of this seems to be in place. In the little plain of the oil well there is also a thickness of a few feet (perhaps generally from three to a dozen or even more) of wash or soil and recent alluvium that covers the rocks in the hollows. Indeed, well No. 2 of this year has now been dug to a depth of over 111 feet before coming to solid rock, and a great part of this depth is probably in wash.

The following seems to be the section downward of all the rocks of nummulitic age exposed within a quarter of the oil wells, and perhaps also within a much greater distance, for the many saddles bring the rocks again to the surface, perhaps with some changes of texture, or hardness, or thickness, or color, in the same beds:—

Thin layered, reddish brown, fine grained, hard calcareous sand rock with softer, thinner, redder layers . . .	about 12 feet.
Gray, slightly reddish, soft coarse sand rock . . .	" 12 "
Red, coarse, calcareous, thin layered, sand rock, with white calc spar seams . . .	" 8 "
Soft greenish gray, coarse sand rock . . .	" 30 "
Coarse gray, slightly reddish sand rock . . .	" 30 "
Coarse brown pebble rock, thinning out . . .	" 5 "
Bright red shales, mostly soft, but with some hard layers . . .	" 30 "
Brown shaly sand rock, thin layers, with shales between . . .	" 4 "
Greenish gray shales and sand rock . . .	" 2 "
Bright red shales (partly hidden) . . .	" 4 "
Gray, slightly reddish, weathering dark brown, hard, rather coarse, compact, a little cross bedded sand rock . . .	" 10 "
Bright red shale (partly hidden) . . .	" 15 "
Bright red shale, with some layers of greenish gray (partly hidden) . . .	" 8 "
Chiefly red or reddish gray sand rock and red shales . . .	170
Light yellowish brown, soft, irregularly bedded sand rock, with some thin (six inch) layers of harder nodules and some brown shales . . .	about 10 feet.
Yellowish brown, hard sand rock, extremely full of nummulites . . .	" 3 "
Brown hard, nodular sand rock, made up of little and big nodules, very irregularly joined together . . .	" 4 "
Very soft greenish gray and brown sand rock or shales, with some harder, six-inch, layers of brown sand rock, <i>only or bituminous</i> . . .	" 20 "
Brown, very coarse pebble rock; the pebbles are rounded, and mostly of sandstone, and some of them six inches long or more; some of them were of a brighter yellowish brown than the rest of the rock; a few small ones are of limestone, from two feet to six feet, say . . .	" 4 "
Very light brown soft sand rock . . .	" 7 "
Pebble rock like that just described . . .	" 1 foot.
Light brown, very coarse soft sand rock . . .	" 7 feet.
Fine pudding rock, full of nummulites, hard (calcareous?) . . .	" 1 foot.
Very light brown soft sand rock or shales, with here and there a harder rib of the same, and perhaps some red near the bottom . . .	" 20 feet.
Light brown or slightly brownish gray, very coarse thin layered shaly sand rock . . .	" 3 "
Chiefly brown sand and pebble rocks . . .	80
Red shales . . .	about 2 feet.
Light brown calcareous sand rock or sandy lime rock in thin (four-inch) layers exposed . . .	" 1 foot.
Red shales or clay, with about one foot of the same sandy lime rock, in thin layers, about two-thirds of the way down . . .	" 20 feet.

Dove-colored rather pure-looking, thin layered lime rock	about	3 feet.
Red shales ? hidden	"	2 "
Same lime rock as last, but irregularly bedded	"	2 "
Red shales or clay	"	15 "
Same but less pure-looking lime rock	"	3 "
Red clay ? mostly hidden	"	2 "
Reddish and greenish hard calcareous shale	"	1 foot
Red clay ? hidden	"	9 feet
Rather pure-looking dove-colored lime rock, such as above, and shales of a like kind, and softer shales, partly hidden and partly exposed, a succession of beds	"	180 "
Bright red clay or fine shales	"	10 "
Same succession of lime rock, hard and soft shales, partly hidden	"	20 "
Gray lime rock, red and gray shales		180
Bright red shales, perhaps		60
Whole series exposed		500

4—OIL AND ASPHALT.

b. Yield.—The oil wells were first dug in 1866 by Mr. Fenner near a natural spring. There are seven or eight holes dug by him lying in a general north-east and south-west direction, and within 70 yards north-east and 50 yards south-west of the main well, and within about 20 yards of each other. Two or three of the holes are shallow, and most of them have fallen in, and seem never to have yielded oil. One however, 50 yards north-west of the main well, is said to yield a little oil, but much less than the main well, and it is therefore neglected. It is 13 feet deep, and goes something over half of that distance into the solid rock.

Another hole (now filled up), 20 yards south-west of the main well, yielded still less oil, and a few drops were seen upon the water that was there; one or two of the other holes show a trace of oil also at times. The main well was the most promising when all these holes were 15 feet deep, according to Mr. Fenner's report, and yielded "25 seers a day," about six gallons. It was therefore deepened by him in 1869 to 35 feet, and yielded then, he reported, "seven or nine *garrahs* every morning," which would be about 25 gallons, allowing a gallon or two for waste in the "wasteful manner of gathering" which he speaks of. At the end of March 1870 the same well yielded about five gallons a day (one *garrah* and a half to two *garrahs*) when the oil was gathered every day; but when the well had been neglected for a week, the yield would be about 30 gallons for the first day.

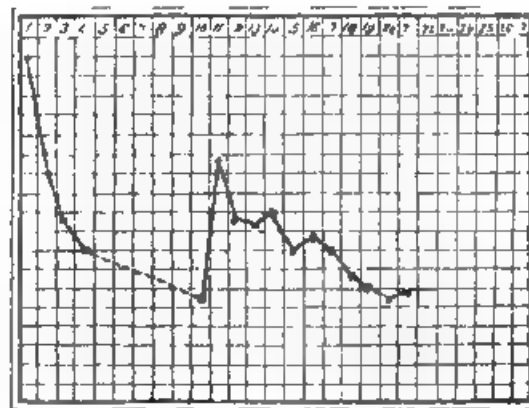
On the 8th of April 1870 a boring was begun in the bottom of this well, and was carried to a depth of 75 feet from the surface. The largest yield of the well and boring on any one day was 50 gallons on the 28th of May, just after the boring was finished. The whole yield of the well and boring since the 8th of April has been—

From the 8th of April 1870 to 28th of May 1870	about	500 gallons.
In the week ending 11th June 1870	"	180 "
Do. 11th " "	"	120 "
Do. 18th " "	"	97 "
Do. 25th " "	"	80 "
On the 27th and 28th " "	"	23 "
In the week ending 6th Aug. "	"	55 "
Do. 13th " "	"	128 "
Do. 20th " "	"	94 "
Do. 27th " "	"	91 "
Do. 3rd Sept. "	"	99 "
Do. 10th " "	"	70 "
Do. 17th " "	"	88 "
Do. 24th " "	"	79 "
Do. 1st Octr. "	"	66 "
Do. 8th " "	"	60 "
Do. 15th " "	"	58 "
Do. 22nd " "	"	59 "

1,963

From the 28th of June to the end of July no oil was gathered owing to a caving in of the well. On the 9th of August a pump was fixed in the well for the first time, and the increased yield from about that time seems to be mainly due to frequent pumping, but partly perhaps also to the re-opening of crevices on the rocks by the water of the rains that soaked through them, and was pumped out by the borehole. The irregularity of the yield in the last weeks (which is still more striking in the daily record) may perhaps be owing either to irregularity of pumping or else to changes of weather not reported.

A diagram showing the foregoing weekly yield of the well gives what is



clearly a broken parabolic curve, and shows that the well will, at the end of this year (1870), yield some 30 or 40 gallons a week, and that the yield will continue worth pumping until 1st July or 1st October 1871, although very small at last. The diagram shows also that the future yield of the well will be about 1,000 gallons, making its whole yield about 3,000 gallons.

On the surface near the main well, and north-easterly from it towards the next best yielding hole, is a quantity of hardened mineral pitch or asphalt (called by the natives "moomeen") upon the surface of the ground, clearly the result of the drying of oil that has flowed here naturally in past times. This asphalt covers a space about 30 yards long, and averaging say three yards wide, with perhaps an average thickness of six inches, and making the whole quantity some 15 cubic yards. It is in parts pretty pure, but in other parts much mixed with sand and gravel. It would probably weigh on the average something like a ton and a quarter to the cubic yard, or in all about 19 tons. Of gas it would yield to the cubic yard probably somewhat more than as much as half a ton of oil, or some 11,000 cubic feet.

c. Outcrop.—In the main well (or well No. 1) and in the hole close by it, and on the surface of the ground for a few yards north-east of it, is exposed a soft greenish gray sand rock, and the position of the asphalt shows that the oil issued from it, especially from cracks in it; but the whole rock seems impregnated with bitumen or dried oil, and looks brown on the inside, while weathered gray outside. There is also exposed near to this rock a hard, rather shaly (limy?) sand rock quite filled with nummulites. The soft greenish gray sand rock which contains the oil (perhaps from the decomposition of the soft parts of the bodies of the nummulites, so wonderfully numerous) seems to be the rock about 20 feet thick, noted as bituminous in the general section, about 17 feet below the top of the series of brown sand rocks and shales. The outcrop of this bed of rock runs probably about north 50° east from the wells, but is not exposed there within half a mile at least. Westward it runs nearly in the same direction, with some crooks for about a quarter of a mile, without any good exposure, and then turns northerly and then north-easterly around the middle of the basin. At this turn it is partly exposed, and seems to contain no bitumen, but from about 50 yards north-east of the turn for about 200 yards in that direction it is seen to be impregnated with bitumen in the same way as at the oil wells, and, although weathered greenish gray outside, looks brown

inside, and gives out a bituminous smell. This exposure of bituminous character is a quarter of a mile north-west of the main well, just below a dam across a small watercourse, and along the hillsides on either hand. No asphalt, apart from what impregnates the sand rock, is seen here. About 150 yards north-east of the turn northward the outcrop is cut short by a fault nearly at right angles with it, and thrown about 160 yards south-easterly to the ridge next north of the wells, and then runs north-east for half a mile or so at least. The oil-bearing bed crops out likewise along the brow (nearly east and west) of the second hill north of the oil wells, about 360 yards north of them, with a northerly dip, the northern side of a saddle. Another saddle, with so steep a southern dip as to amount to a fault in some places, brings up the same bed again along the brow of the nearly parallel ridge, some 60 yards still further to the north. But in all these outcrops, wherever exposed, it seems not to be bituminous, except in the places already mentioned. Indeed, the deposit of oil at the wells seems, like those found elsewhere in the district, to be of very limited extent—perhaps a few score yards at most.

d. Working.—It is clear, then, that any digging or boring should be made at first very near to the main well, so as not to fall quite outside of the deposit. As the rock just here dips steeply some 60° or more north-easterly, every 55 feet in that direction will find the bed at 100 feet greater depth if the dip should continue uniform. The rock however, as seen in the digging close to the oil well, changes its dip here two or three times within four or five yards, with little saddles and basins, so that its place at the distance of 55 feet cannot be counted on with certainty: still its most probable place is as just mentioned. It is possible that if the oil-bearing bed should be bored into at the depth of 100 feet or thereabouts, it might yield more oil there than at the present well; but it is not very probable.

The whole cost of the boring and digging of this year has, however, been at least equalled by the value of the oil taken; for that expense up to the end of September was about Rs. 1,200, or a little more, making the 2,000 gallons of oil cost about 10 annas a gallon. The cost in America of refining crude oil is about five annas or less a gallon; even if it were double that here, the cost of refined oil from this source would be but 20 annas a gallon, or less than half what it costs in the Rawalpindi market. If the crude oil yields 50 cubic feet of gas to the gallon as expected, the cost of this oil for gas would be at the rate of one anna for eight feet, or Rs. 7-13 for 1,000 feet.

On the 23rd May 1870 another well for a boring ("well No. 2") was begun at 50 feet north-west by west from boring No. 1 (by mistake this point was taken instead of "30 feet north-north-west," as directed), and on the 1st of October it had been dug to a depth of over 111 feet without coming to any solid rock on which to begin boring,—nothing but red and gray mottled clay. The object of the boring was to test the oil-bearing bed at a depth of 75 or 100 feet quite under cover, but not far from the first boring. The bed at the place taken for the well will, however, be somewhat deeper than that—say 150 feet to the bottom of it. If the dip should have grown steeper than at boring No. 1, or prove greater than 60 degrees, the depth may be still greater.

In August (contrary to the indications of this survey) a second boring was begun alongside of boring No. 1 in the same well; but, at the depth of about eight feet, was stopped by the sticking fast of a chisel that could not be removed. The boring of another hole so near the first was not advised, because the first would probably drain the rock of oil for some distance around it so thoroughly as to make another boring unlikely to pay its expense.

On the 24th September 1870 a third boring was begun at 88 feet east north-easterly from boring No. 1, to be carried on at the same time with the digging of the second well, and to test the oil-bearing bed at a distance of 100 feet or so from the first well along the strike. On the 4th October 1870 a hole was likewise begun about 80 feet north-north-west of boring No. 3 to test the bed again at a depth of about 75 or 100 feet. If these holes should give encouragement, a hole might well be bored about 50 yards north-easterly from boring No. 1 near an old hole that has a show of oil in it; after that, if still

encouraged by the borings already made, one might be made at 30 feet north-north-west of this last, and so on, feeling the way along the strike north-easterly, and at the same time north-westerly to the dip. If these borings near the outcrop are successful, still deeper ones might be made to the dip. The borings themselves will give, as they go on, better and better information in regard to the course of the bed, both strike and dip, and be a guide to future borings.

5.—SHIPMENT.

As the well is close by the big road from Futteljung to Campbellpore, the oil or asphalt can be carried away either on camels or in bullock carts. The distance by the old road to Rawalpindi is 27 miles and a half; by the new road about 30 miles.

7.—BOOKS AND PAPERS.

The Gunda oil springs are spoken of in the "Report on Petroleum Operations" by A. Fenner, Assistant Engineer, Proceedings of the Government of Punjab, Public Works Department, 17th June 1866, in a letter on the Gunda Oil by Doctor T. E. B. Brown, Chemical Examiner, Supplement to the *Punjab Government Gazette* for 7th February 1867; in a manuscript Memorandum, No. 220, by Major C. H. Hall, Deputy Commissioner, 15th February 1868, on file in Public Works Department, Lahore; in a "Report on Borings for Petroleum by A. Fenner, Executive Engineer, Proceedings of the Government of Punjab, Public Works Department, July 1869, pages 2, 3, and 6; and in a "Note on the Petroleum Locality of Sudkal," by A. B. Wynne, F.G.S., Geological Survey of India, Records of Geological Survey of India, Vol. III. 1870 No. 3, pages 73 and 74.

Report on the Chhurrut Oil Lands, Rawalpindi District, Punjab, accompanied by a Geological and Topographical Map of a Rough Survey, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The Chhurrut oil well is 150 yards south-east of the village of Chhurrut, five miles and a half west by north of Futteljung, and 28 miles in a straight line west of Rawalpindi.

2.—LAY OF THE LAND.

The oil well is in the middle of a little valley that stretches with a flat bottom for 200 yards to the east and 125 yards to the west, with a width of 40 yards at the oil well, but of 60 yards further east. This little valley is separated only by a narrow ridge, 60 feet high, from the Bugwan River on the south, which is here about 1,500 feet above the sea, and has a general east and west course. The little valley, only 10 feet above the river in level, is drained into the river around the western end of this hill. On the south side of the river is a flat about eight feet above the river in level and 100 yards wide. South of that is a long double east and west ridge of 80 feet or more in height, followed on the south by a narrow plain and other parallel ridges. North and west of the oil well the land rises to a level of 40 or 50 feet above the river, and reaches back in a plain, 400 yards to the north, to a long east and west ridge, some 40 feet higher, followed closely by other parallel ridges to the north. The village is built on the southern edge of the plain just mentioned.

3.—GEOLOGY.

a. Structure.—The rocks of the first long ridges on the north and south are in the main the same and dip away from the river, giving the whole valley between the appearance of a rock saddle valley or anticlinal valley, of half a mile wide. But the saddle is not a simple one, and has within it some eight or ten smaller saddles, and perhaps the southernmost of them should rather be considered as giving an anticlinal character to the southern mountain, and possibly the corresponding anticlinal on the north, which is half hidden, should

cause the valley to be regarded rather as a rock basin with smaller rolls within it. At the oil well itself the rocks form, it seems, a very small saddle; 40 yards south is another, and about 140 yards south of that probably another, and 80 yards south of that is another, and 100 yards south of that still another. On the north there seem to be small saddles at 50, 110, and 210 yards north of the oil well, and perhaps still others at 290 and 400 yards north of it.

b. Rock Beds.—The rock beds exposed in this neighbourhood are in the main the same as those seen around the Gunda oil wells, three miles to the east, but with some variations, and are of nummulitic age, except perhaps near the bottom. The following sections are exposed near the Chhurrat place:—

In the double ridge south of the Bugwan very soft green- ish gray sand rock	about	6 feet.
Rather hard greenish gray sand rock	"	10 "
Hidden	"	4 "
Greenish gray soft sand rock	"	30 "
Hard coarse gray sand and pebble rock	"	2½ "
Greenish gray soft sand rock	"	5½ "
Red shales	"	2 "
Greenish gray soft sand rock	"	5½ "
Hard pebble rock (brown pebbles up to two inches)	"	4½ "
Greenish gray very soft sand rock (only 2½ feet exposed at top)	"	20 "
Greenish gray soft, partly hard, sand rock	"	2½ "
		<hr/>
Greenish and brownish gray sand rock and shales	about	113
Gray nummulitic shale, and two (two-inch) layers of gray lime rock	about	4 feet.
Very light gray lime-rock, crystalline and nummulitic	"	0½ "
Gray shales, full of nummulites	"	2 "
Light gray thin layered lime rock	"	1 foot.
Nummulitic shaly lime rock	"	2½ feet.
Mottled, white, brown, red, but dark weathering lime rock	"	1 foot.
Brown shales	"	2½ feet.
Nummulitic shaly lime rock	"	8 "
		<hr/>
Gray lime rock shales	about	17
A gap here of perhaps	"	50

Then on the north side of the same ridge—

Hard shaly lime rock with iron ore (brown hematite altered from pyrites) in small crystalline nodules	about	8 feet.
Brown shales	"	6 "
Hard gray shaly lime rock	"	4 "
		<hr/>
Gray lime rock and shales	about	13
Here a gap of perhaps	"	30

Then in the north-east corner of the little flat in which the oil wells lie—

Light and dark gray lime rock beds, with gray shales between (in these the oil occurs, and at the well at least the lime rock is sandy)	about	30 feet.
Red shales (thick)	"	2 "

Likewise, probably, the lower part of this last section in the north bank of the Bugwan, just south of the oil well—

Gray lime rock	about	4 feet.
Grayish green shales or clay	"	10 "
Red shales or clay	"	8 "
Hidden	"	5 "
Dark purple shales	"	4 "
		<hr/>
		31 feet.

OIL AND BITUMEN

a. Mode of occurrence.—The oil seems to flow from the crevices of the sandy gray lime rock marked bituminous in the section, and from the more

sandy shales between the layers of lime rock, and to come then from the lower part of the sandy lime rock and shales of the Gunda section. The oil when fresh is dark green in color, but turns brown or black in the air.

b. Yield.—At the oil well a hole was dug by Mr. Fenner in 1869, 20 feet deep according to his report, and a bore hole sunk, he says, to the depth of 72 feet from the surface. He reports that the hole yielded two seers (or say half a gallon) of oil daily. The digging at the time of this survey (April 1870) was almost quite full of muddy water through which many bubbles of gas rose; but the amount of oil on the surface was extremely small, perhaps hardly a spoonful, and the villagers said that there had never been any more. As the oil does not seem to be gathered at all, the amount of it on the water must be the accumulation of a long time, so that the daily, or even monthly, yield would seem now to be extremely little.

On the surface of the ground and of the gray limestone rocks that crop out near the well are irregular deposits of solid mineral pitch or asphalt, sometimes a little softened in the heat of the sun, in some parts quite pure, but in others much mixed with sand and fine gravel. These deposits reach to 33 yards east of the well, and to 17 yards west of it, with a gap of 20 yards where none is exposed, just west of the well. The whole length then is about 60 yards; its average width is perhaps $1\frac{1}{2}$ yards, and its average thickness $\frac{1}{4}$ yard, making the whole amount 15 cubic yards. This impure asphalt would perhaps weigh a ton and a quarter to the cubic yard making 19 tons in all, and perhaps yield of gas as much to the cubic yard as half a ton of oil, or say 11,000 cubic feet. In the south bank of the Bugwan River, about 275 yards south-east of the oil well, are exposed within a space of 50 yards four deposits of solid impure asphalt, plainly thrown down by the river in a former bed. They are 1, 5, 3, and three yards long, and average about one-sixth of a yard in thickness, and reach into the bank perhaps one yard on the average, giving in all two cubic yards or $2\frac{1}{2}$ tons. There would be then in all 17 cubic yards, or $21\frac{1}{2}$ tons.

d. Working.—As the rocks here are in a saddle form, with a steep dip of about 70° on either side, it is necessary of course in boring to bore either along the top of the saddle, or within a short distance of it on either side. The northern dip of the saddle is the plainest, and the oil-bearing bed would be found at 100 feet greater depth for about every 17 feet of level distance in this direction. The small yield of the present holes, however, does not give encouragement to expect much oil from any deep borings. This oil deposit seems, in common with the others of the Punjab, to be of very limited extent; and it would therefore be necessary in boring to keep at the outset very near to the surface exposure of bitumen.

6—SHIPMENT.

The bituminous earth or any oil that may hereafter be found could be carried either on camels or mules three miles to the big road at Gunda, and could thence be carried either in the same way or in carts 27 miles and a half to Rawalpindi, or 30 miles and a half in all by the old road, say 33 by the new.

7—BOOKS AND PAPERS.

This oil place is spoken of in the "Report on Petroleum Operations," by A. Fenner, Assistant Engineer, Proceedings of the Government of Punjab, Public Works Department, July 1866; and in the "Report on Borings for Petroleum," by A. Fenner, Executive Engineer, Proceedings of Government of Punjab, Public Works Department, July 1869, pages 3, 4, 5, and 6.

Report on the Boraree Oil Lands, near Chhurrut, Rawalpindi District, Punjab, accompanied by a Geological and Topographical Sketch Map, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1—SITUATION.

The Boraree well, Rawalpindi District, Punjab, is three quarters of a mile south-west of Chhurrut, $6\frac{1}{2}$ miles west of Futtchjung and $28\frac{1}{2}$ miles in a straight line west of Rawalpindi.

2.—LAY OF THE LAND.

The oil well is in the bed of a very small brook, at its union with a somewhat larger brook called the Bararee Kussee, both coming from the west, and flowing 230 yards further east into a still larger brook that comes from the south, and flows 300 yards further northerly into the Bugwan River, just at a great bend it makes from running westward to running northward. The river here is about 1,500 feet above the sea-level, and the oil well some 15 feet higher. North of the oil well there are four or five ridges, rising from 50 to 70 feet above the river level, with narrow valleys between them, all within a distance of 300 yards. North of that the land is gently rolling for about 500 yards, with a general level of about 50 feet above the river, and then to the north are parallel ridges of some 50 feet high. South of the oil well rises steeply an east and west ridge, of 160 feet in height, followed on the south by a parallel ridge of some 90 feet above the river level, and then by a comparatively flat region with low parallel ridges. West of the oil well the land rises very steeply into two east and west ridges, 130 feet or more in height, or perhaps rather one ridge, with outliers on the south between it and the high ridge, just spoken of. To the east of the oil place the land is in parallel east and west ridges, some 60 or 80 feet high, with high rough valleys between.

3.—GEOLOGY.

a. Structure.—The high hill or mountain just south of the oil place seems to be made up of rocks in saddle form in the main, but with two subordinate rolls on the south side, and one or two others on the north side. South of these is perhaps another saddle, still within a quarter of a mile of the oil well; just south of the well seems to be another saddle, and some 10 yards north of the well a very sharp up-throw or fault of perhaps 50 yards, and at about 190 and 260 yards north of the oil well other saddles.

b. Rock Beds.—The rock beds exposed are the same as those to be seen near the oil well at Chhurut, and in the main the same as those about the Gunda oil wells, four miles to the east, but with some variations, and are of nummulitic age. The following sections (downward) are exposed near the Bararee well. South of the mountain and south of the oil places—

Reddish sand rock, with white calc spar seams, perhaps	about 50 feet.
Reddish gray soft shaly sand rock	" 21 "
Slightly reddish gray sand rock	" 71 "
Reddish sand rocks and shales	" 5 "

On the north and south side of the same mountain—

Brown sand rock and shales ? hidden	about 74 feet.
Red-pebbled pebble rock	" 7 "
Gray (brown weathering) sand rock	" 20 "
Brown and gray pebble rock, sandy	" 12 "
Greenish gray, rather soft, sand rock	" 3 "
Brown sand rock and shales	" 112 "

On the south side of the same mountain, and at about two hundred yards east of the oil well—

Light gray lime rock	about 5 feet.
Gray nummulitic lime pudding rock	" 20 "
Red shales, perhaps	" 10 "
Greenish gray sand rock	" 1 foot
Gray (weathering brown) sandy lime rock	" 5 feet.
(In parts a greenish gray sand rock, in other parts a pebble rock).	
Greenish gray sand rock	" 20 "
Red shales	" 8 "
Greenish gray shaly sand rock	" 1 foot.
Red and green shaly clays, with salt and bitumen	" 30 feet

Gray lime rock and shales	100
	270

4.—OIL AND ASPHALT.

a. Mode of occurrence.—The asphalt here, then, seems to be near the upper part of the 190 feet of gray lime rock and shales of the Gunda section. For some 15 yards west of the digging the shales are bituminous, and 3 feet in thickness of them richly so. But the well (some 2½ yards in diameter, and, it is said, about six feet deep), although in line with these bituminous shales, exposes only a surface deposit of earthy asphalt, merely wash or alluvium that has been thrown down by the brook in its former bed. The whole is nearly full of muddy water, so that anything below this is hidden. Gas bubbles rise almost constantly in the water, especially in warm weather, seeming to be set free from the asphalt by the heat of the sun. The same heat likewise, as it seems, causes small streams of oil to flow from the edge of the same deposit of asphalt for a distance of some 18 yards east of the well where the asphalt is covered by a bank of red earth on the north side of the bank. The amount of this asphalt seems to be about six cubic yards (9 yards long by 1½ yard average width, and ⅔ yard average depth); more may be hidden under the gravel and clay of the bank, which seems somewhat bituminous. The amount of oil is insignificant, perhaps a spoonful a day from the little streams on the bank, and in the whole there is on the water scarcely a trace of oil. About 175 yards east of the hole are exposed likewise in the north bank of the same stream, about two feet apart, two wash deposits of asphalt or bituminous red clay, only in the sun's heat. They are each some 3 feet long by perhaps 18 inches wide and a foot thick, and would yield therefore about one-third of a cubic yard. These deposits of earthy asphalt on the Boraree Kussee would perhaps weigh a ton and a quarter on the average to the cubic yard, and yield perhaps as much gas to the cubic yard as half a ton of oil, or say 11,000 cubic feet.

b. Boring.—It is plain that any borings to be made to test the richness in oil of the main deposit must be made very closely along the line of outcrop, that is, about north 86° east and south 86° west of the present digging; for the dip here is almost vertical, say 87°. The dip is northerly, so that the borings should be made rather on that side of the outcrop than on the other; but with a dip of 87° the bed would sink 100 feet in about five feet of level distance northerly. The deposit, however, seems to be, like the others in the Punjab, one of very limited extent, as the same beds do not seem to be bituminous at any great distance, even 20 yards west of the digging, so that any borings should be made very near to the present hole. The prospect, however, is little encouraging for any such expense, and the better plan would be to dig the bituminous earth alone, and be satisfied with this easily won though at this point rather scanty source of oil and gas.

5.—SHIPMENT.

The bituminous earth could be carried only on the backs of animals by the present roads, either mules or camels, to Gunda, three miles and three quarters, and thence on the big roads either in the same way or by carts 27 miles and a half to Rawalpindi, in all say 31 miles, or by the new road 34 miles.

Report on the Jafir Oil Bore of 1869, Rawalpindi District, Punjab, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

The Jafir boring, made for oil in 1869 by Mr. A. Fenner, is on the east bank of the Ramora brook, one mile and a half north of Jafir, one mile and five-eighths south-west of Chhurut, six miles and a half west of Futtchjung, and 29 miles west of Rawalpindi. Mr. A. Fenner reports that he bored here 42 feet deep, chiefly or wholly in red sandstone, but that he found at most only a slight trace of oil. At present nothing is to be seen here but a hole, about four feet in diameter, nearly full of water, with a small exposure on one side of bluish gray soft shaly sand rock. The rock has a strike of about north 87°

east, and a dip of about 60° northerly. There is not the slightest trace of oil nor sign of its existence, and none is known ever to have been found there except the slight trace mentioned by Mr. Fenner. He does not think any further exploration here advisable, and certainly every thing seems to give strength to his opinion.

7.—BOOKS AND PAPERS.

The work at this place is described by Mr. A. Fenner, Executive Engineer, in his report on "Borings for Petroleum" in the Proceedings of the Government of Punjab, Public Works Department, July 1869, pages 5 and 6.

Report on the Dulla Oil Lands, Rawalpindi District, Punjab, accompanied by a Geological and Topographical Sketch Map, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The Dulla oil lands are 38 miles and a half due west of Rawalpindi, 16 miles west north-west of Futtchjung, three miles south south-west of Boota, and two miles and a half north-north-west of Buttiot.

2.—LAY OF THE LAND.

The Dulla brook is a small stream that winds through the central parts of the Choor Mountains. Near the old Dulla trial pit the course of the brook is about north, and the pit is in the southern corner of a little flattish piece of ground, about 100 yards wide north and south, 300 yards long east and west. About 100 yards up-stream, south, is another flat of about the same size and parallel to the other, and through it the brook, and for a mile or more to the east, flows westerly; 200 yards north of the pit the brook turns from its northerly course, and flows again westerly for a mile or more, and then north-westerly; 300 yards west of the Dulla pit the Oodee brook, still smaller than the other, runs a little west of north into the Dulla brook, and at its mouth is another flat somewhat larger than the two already mentioned, and here is the deserted house that was once the Oodee salt chowkee. On the Oodee brook, a third of a mile west south-west of the Dulla pit, is the Oodee pit in a flat about 50 yards long and wide, and above this the brook has a north-easterly course, and is very small. Both pits are about 1,750 feet above the sea. The space between the two brooks and the two pits is filled by a steep hill, rising at one point to a height of about 270 feet above the pits, or perhaps 350 feet above the junction of the two streams. East and north of the Dulla pit are other steep hills of less height, and south and west of the Oodee pit are others still.

3.—GEOLOGY.

The rocks near the two trial pits lie in saddle form; those at the Dulla pit dip some 60° northerly, and those at the Oodee pit about as steeply southerly. Some 10 yards north of the Oodee pit the place of the axis is to be seen, and its dip seen to be some 20° westerly. The course of the axis is probably about north 83° east. The dip on the north side of the saddle seems to be gentler than that on the south, and, within a quarter of a mile of the axis, becomes about 30° only.

The chief rocks exposed are a bluish gray lime rock, in great part flaggy with perhaps some gray or light brown shales between the layers here and there. The whole thickness of these rocks would seem to be something more than 1,100 feet. No fossils have been found in it, but its age is probably the same as that of the Ruita Otoor lime rock, and also of the Punnoba lime rock, both nummulitic, and probably, too, the same as the main nummulitic lime rock of the Salt Range, as, for example, that of the Burra Kutta and Chhota Kutta oil springs near Jaba, a dozen miles east of the Indus.

Something more than 300 feet above the lowest exposed beds of rocks there is found a small amount of asphalt in the cracks of the lime rock through a thickness of some six feet.

Above the nummulitic lime rock, and unconformable with it, are about five feet of a brown pudding rock and travertine, like those of Gunda and near the mouth of the Bussala River. It lies nearly or quite level, seems never to have been disturbed, and is of very small extent, only seen near the Dulla pit.

4.—OIL AND ASPHALT.

The asphalt is merely dried oil that was once liquid in this place, and might still be found so at a distance from the surface of the ground. It is exposed in both of the old trial pits, and in the heat of the sun a small portion of it melts, and becomes a black tar. There is also a small quantity of the asphalt in the wash near the Dulla pit, cementing together the rounded pebbles of the old bed of the brook. This deposit is some six feet long and about three feet thick at most, with an average thickness of say two feet, and a width of perhaps a yard though this is hidden in bank. Allowing one-half for the larger pebbles, there would be, then, some nine cubic feet of earthy asphalt. At the Oodee pit there is exposed in the cracks of the rock something like a cubic foot and a half of like asphalt. In all, counting some that is exposed in the rock of the Dulla pit, there is perhaps half a cubic yard of earthy asphalt, which would weigh say five-eighths of a ton.

There is no liquid oil exposed at all; the nearest approach to it is a few spoonfuls of black tar that has melted out of the asphalt in the sun's heat.

The outcrop of the oil-bearing or asphalt-bearing bed probably runs on the north side of the saddle is not far from a straight line from the Dulla pit to the Oodee pit, and near this turns and runs for a quarter of a mile at least a little south of east. East of the Dulla pit its course is about east.

As the outcrop of this bed through all this course has not been observed to be oil-bearing, it is highly probable that this character does not extend far from the pits in any direction. In order to test this point, therefore, by boring or deep digging, it would plainly be best to try at first only a very short distance from the pits, and then, if encouraged by success, to go further and further from them by degrees. The first boring ought to be, where the bed would lie, of not more than 50 or 100 feet deep below the surface of the ground, that is, not more than about 50 feet northerly from the Dulla pit, or 90 feet south-westerly from the Oodee pit. If the result of such a trial should be encouraging, a deeper boring might be made 120 feet northerly from the Dulla pit, or 150 feet south-westerly from the Oodee pit, so as to strike the oil-bearing bed about 200 feet below the surface. These borings would themselves show more precisely than is known at present the dip of the bed at either place, and would be a guide to further borings.

But the very unpromising amount of asphalt at either pit gives small encouragement for such borings, and the smallest of them would only be advisable on the part of the Government (never of any private individual) after meeting with fine success on other oil lands of the Punjab.

5.—SHIPMENT.

The inaccessibility of the place is another drawback. It would be possible, however, to transport oil or asphalt down the Dulla brook, then up the Oodee brook, to the Oodee digging, a distance of three quarters of a mile; or a smoother road, but steeper, might be taken across the ridge between the two pits, rising to a height of 175 feet above them, but going a distance of only a third of a mile. From the Oodee pit the road leads south-westerly to Buttlot, a distance of three miles. Most of the distance from Dulla pit to Buttlot is by an extremely bad road, though a well-travelled one; it runs where possible through the bed of the water-courses, and is very narrow, and much encumbered with large stones. From Buttlot there is a bridle path eastward to Chhurrut, 11 miles and a half, and thence still eastward to Gunda, three miles. Thence south-easterly by big wagon road, two miles and a half to Putehjung, and thence easterly by a big road, 25 miles to Rawalpindi, or 17 miles and a half of bridle-path from Oodee pit to Gunda, and 27 and a half of big road from Gunda to Rawalpindi, 45 miles in all. The big road might instead be struck at

Jafr, seven miles west of Futtchjunj, but the whole distance would still be about the same.

7.—BOOKS AND PAPERS

The workings at Dulla are described in the report on "Borings for Petroleum," by Mr. A. Fenner, Executive Engineer, in the Proceedings of the Government of Punjab, Public Works Department, July 1869, pages 4, 5 and 6.

Report on the Punnoba Oil Lands, Kohat District, Punjab, accompanied by a Geological and Topographical Sketch Map, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The Punnoba oil springs, in the Kohat District, are in a straight line, 67 miles due west of Rawalpindi, 25 miles due east of Kohat, three miles and a half north of Shekh Khan, the same distance west north-west of Choorlukkee Meeshuk, and half a mile south-east of the village of Punnoba, some five miles south-east of the boundary of the land of the Afreedees.

2.—LAY OF THE LAND.

The springs, three in number, within 25 feet of each other, are about 1,150 feet above the sea in the eastern edge of the Punnoba brook, or close beside it just where the brook cuts through the first south-eastern high ridge of the mountains that separate British India in this region from Afreedestan. This ridge runs north-easterly and south-westerly, is about 400 feet high, and has a quarter of a mile to the south-east a parallel ridge of about 70 feet high, and south of that a plain many miles wide. North-west of the main ridge, at a distance of a quarter of a mile, is another nearly parallel ridge, about 100 feet high; north-west of that is a narrow valley in which lies the very small village of Punnoba (deserted during the hot season, and without drinking water then), and north-west of that are high mountains in parallel ranges. The brook flows south-easterly from the village to the oil spring, then southerly for a quarter of a mile to the low ridge, then easterly 300 yards, then southerly around the eastern end of the ridge, and then easterly again. The slopes of the ridges are quite steep, especially where the brook breaks through the one by the oil springs.

3.—GEOLOGY.

The rocks at the oil spring dip steeply (70°) south-easterly; but it seems to be a reversed dip on the north-western side of a rock saddle that composes the high ridge, with a gentler dip on the other side. About 175 yards south-easterly from the oil springs there is another saddle in the rocks, with a dip of about 45° on the northerly side, and of about 80° or more on the southerly. Scarcely 30 yards south-easterly from this saddle the dip changes again to a steep northerly one, at first some 45° , then even 90° , then 70° , and at length, a quarter of a mile south of the oil springs, only 30° . The first ridge north-west of the oil springs is formed by a rock saddle with dips of about 45° on either side, and there seems to be but one basin between this and the oil springs.

The rocks all seem to be of nummulitic age; at the top some 500 feet of gray lime rock, mostly in thin much broken layers with some shales; below that some 500 feet of bright red sand rock and red shales, somewhat limy in the upper part, with white calc spar seams, and below that brown sand rock and brown shales, with some small pebble rock beds. The lime rock contains nummulites and other fossils, particularly a small bivalve shell, like an oyster, three quarters of an inch long, and it is probably the same as the great nummulitic lime rock of the Salt Range. The red sand rock and shales below seem to have no fossils, but closely resemble some of the red sand rocks at the top of Gunda group, to which they probably belong. The brown sand rock at bottom, with its pebble rock beds and shales, likewise resembles closely the brown sand rock, pebble rock, beds and shales of the Gunda group, and although less filled with fossils, what seemed an imperfect nummulite was found in it.

4.—OIL.

The oil of the springs seems to come from the cracks in the lime rock through a thickness of some 20 feet of the bed, at a distance of some 175 feet above the red rocks.

The three springs altogether would yield perhaps half a gallon a day if gathered daily; but it is only taken by the natives at odd times and with the help of wisps of grass, which sop it up, and are afterwards squeezed by the hand. They use it to burn in lamps; but it is so far inflammable that it can only be used with a lamp that has a tube expressly for the wick. If burned with the wick unprotected by such a tube (as the Gunda oil is burned safely), the oil all blazes up.

The outcrop of the oil-bearing layers of rock runs from the springs north-easterly and south-westerly, probably in nearly a straight line (say north 62° , east), with a very steep northerly dip or a quite vertical one, or a reversed southerly one. Some 250 yards north-westerly of this outcrop is probably another nearly parallel outcrop of the same rocks, with a south-easterly dip of say 45° , and consequently with bends to the north where the ground rises into hills. About 350 yards north-westerly of the oil springs is probably still another outcrop of the same layers, with a north-westerly dip of about 45° with corresponding bends to the south wherever the ground is high. No other oil springs have been discovered along these outcrops, even where they cross the brook; and is not likely that the oily character of the rocks extends to any great distance from the three springs. It is clear, therefore, that any borings to test the yield of the oil-bearing bed at some depth below the surface of the ground should be made to begin with as near as may be to the oil springs. As the dip there is some 70° south-easterly, a distance of about 36 feet in that direction would bring the bed to a depth of 100 feet deeper still, and so on. It is probable, however, that the dip of the bed in following it down soon changes to a northerly dip, which grows gentler and gentler to the middle of the basin where the bed is probably only about 500 feet below the level of the oil springs. It would be best, therefore, to make the first boring only 10 yards or so southerly from the oil spring, and it will probably strike the bed within 80 feet below the level of the spring, and follow it to a depth of 200 feet or more from the level of the springs. The bed can also be traced along by borings, say 100 feet north-easterly and south-westerly near the outcrop.

Salt.—The brook for a quarter of a mile above the springs and one-eighth of a mile below them, but especially within 75 yards above them, has a great many pools of very salt water, and even the village spring, about a quarter of a mile above the oil springs, is quite brackish at the end of April. The saltiness of the water comes from that character in the rocks and shales from which it seems to have issued; the brook above and below is quite dry.

5.—SHIPMENT.

A bridle-path leads from the oil springs south-easterly to the big road about two miles and a half; and by this big road, very good for mules and camels, but hardly fit for carts, the distance is nine miles to the big wagon road that leads west 26 miles to Kohat, and east four miles and a half to the Indus at Khooshialgurh and thence 71 miles to Rawalpindi, and in all 37 miles and half to Kohat, and 87 to Rawalpindi.

Report on the Aluggud Oil Lands, Bunnoo District, Punjab, accompanied by a Geological and Topographical Map of a Rough Survey, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The Aluggud oil lands are on the Aluggud brook, about 10 miles and a half south of Bessa Khôl, Bunnoo District, Punjab, two miles north-west across the mountains from the ancient ruins of Kafir Kot, and 124 miles south-west by west of Rawalpindi.

2.—LAY OF THE LAND.

The oil lands lie near the foot of a north-west and south-west ridge, about 500 feet high, that has a slope of nearly 25° on the south-western side, and is much steeper on the other. Between this and other parallel ridges on the south-west, from 100 to 200 feet high, the Aluggud brook (here about 750 feet above the sea) winds in a general northerly direction. It comes to the oil lands in a north-westerly course through gaps in these lower ridges, makes an oxbow 200 yards across towards the west, then, instead of cutting through a narrow neck of a ridge of clay, it makes a curious cut in oxbow shape again to the east, about 100 yards across through the lower part of the high ridge just mentioned in very hard rocks; the cut at first scarcely eight yards wide, afterwards 40, and then at the lower end half a dozen yards again, and throughout bordered by cliffs up to 150 feet or so in height. After that the brook flows half a mile or so westerly, and then north-westerly and northerly in a valley perhaps half a mile wide. The high ridge is cut through from east to west by three small valleys. The ridges east of the high one first mentioned are still higher, and rise to 2,200 feet above the sea.

3.—GEOLOGY.

The geological structure throughout these oil lands is extremely simple; the rocks all dip south-westerly, and a nearly uniform dip of about 25° , and they seem to form the westerly part of a great rock saddle.

The following is a section downwards of the beds of rock exposed here:—

Soft gray sand rock exposed here, say	about 100 feet.
Red and greenish gray clays with a few layers of brown sand and pebble rock [at 202 feet from the top such a layer (sand and pebble) three feet thick; at 310 feet one (sand) three feet thick; at 370 feet one (sand and pebbles) three feet; at 380 feet one of three feet; at 400 feet one of three feet; at 450 feet one of five feet; and at 175 feet one (sand) of 10 feet]	700 "
Coarser (up to six inches) pebble rock, with pebbles of crystalline rocks of metamorphic red sand rock, of magnetite, especially for two feet at the bottom, and of cherty lime-stone, with imperfect <i>mermure</i> (?) fossils	40 "
Brown sandy lime rock (with <i>productus</i> and other fossils, weathering gray, in places seeming to become merely a soft gray sand rock, in places richly bituminous)	40 "
Brown and gray shales	150 "
Soft gray sand rock, also bituminous in parts	100 "
Gray sand rock ??	
In all	1,160

The gray sand rock at the top of the section, and the 700 feet of red and gray clays below it, seem plainly to be the same as that at Jaba, in the Salt Range, near Kalahagh, and lie at some 1,100 feet above the nummulitic lime rock, and have commonly been called Siwalik in age. The coarse pebble rock and the underlying lime and sand rocks seem to hold the place of sand rocks of similar nature that lie at Jaba between those clays and the nummulitic lime rock. The rocks of the sections of the two places correspond in fact very well. But the *productus* and other fossils in the Aluggud lime rock seem to show these rocks to be of carboniferous age.

4.—ASPHALT, TAR AND OIL.

a. Mode of occurrence.—The oil that the oil-bearing rocks contained has partly oozed out of it where exposed in cliffs along the brook, and in drying has turned into a thin coating of black asphalt on the rock. At other places along the brook the oil in like manner formed pools that in drying became masses of asphalt. This asphalt partly melts in the heat of the summer sun, and small pools of black tar are formed, some of the smaller ones all of tar, but most of them a mere coating of tar from an eighth of an inch to an inch

deep upon pools of water which the tar protects from drying up. There is now no flow at all of oil proper.

b. Yield.—The asphalt deposits extend in spots for about a quarter of a mile along the east side of the brook, at most some 25 feet wide and one foot thick, and amount in all to about 350 cubic yards. It is somewhat impure from sand and pebbles mixed with it, and would weigh perhaps in all 550 tons. Of the liquid tar in the pools there was in May 1870 about 100 gallons; and this is likewise somewhat impure from leaves and sticks in it, and perhaps a little sand.

c. Outcrop.—The outcrop of the oil-bearing bed of rocks is to be seen in the cliffs along the brook in the oxbow cut in the lower part of the ridge mentioned as 500 feet high and rises to the top of this ridge on either side of the three narrow valleys that cut across it from east to west, that is, the outcrop has a general south-east and north-west course parallel to the strike of the rocks, but with these three long bends to the west where the rocks are cut through by small streams.

d. Working.—As the oil-bearing bed shows no signs of bearing oil, except near the exposures and asphalt deposits already mentioned, it is not likely that it continues bituminous to any great distance. A test by boring should therefore clearly be made as near as may be to these exposures. The most convenient places for the first borings would be in the little flats, just above where the brook enters the gorge in the high hill, and just below where it issues from the hill again. At both the entrance to this gorge and the issue from it the oil-bearing bed is near the water-level of the latter point, and dips south-westerly at such a rate as to be 100 feet lower below that level for about every 200 feet of distance. Owing to the thickness of the oil-bearing rocks, it seems highly probable that borings would meet with success as to the yield of oil. The great hardness, however, of the 10 feet bed of coarse pebble rock would make the boring slow and costly, and perhaps the pebbles by separating now and then from the sides of the bore hole (although they seem in general firmly cemented together) would cause vexatious and serious difficulties in the boring. Should this be found to be the case, it would be desirable to protect this part of the whole by tubing as soon as bored.

5.—SHIPMENT.

The asphalt, tar, or oil could be carried by a good bridle-path (that could at small expense be made passable even for carts) two miles and a half north to the mouth of the Aluggud Valley thence likewise by bridle-path either five miles south to the River Indus at Kafir Kot (whence it could be carried in boats up the river by towing, or down the river by drifting and rowing) or eight miles north to Eesa Khel; thence by wagon road north, 28 miles to Kalabagh, and thence likewise by wagon road (now out of repair near the Indus), 107 miles through Futtehjung to Rawalpindi, or in all 145½ miles to Rawalpindi.

7.—BOOKS AND PAPERS.

The oil place is mentioned in the "Report on the Geological Structure of the Salt Range," by Dr. A. Fleming, Journal of the Asiatic Society of Bengal, Vol. XXII, 1853, No. 3, pages 261, 265, 268.

Report on the Chhota Kutta Oil Lands, near Jaba, Bunnoo District, Punjab, accompanied by a Geological and Topographical Map of a Rough Survey, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The oil springs on the Chhota Kutta brook, near Jaba, Bunnoo District, Punjab, are a mile and a half south by west of Jaba, 10 miles south-east of Kalabagh, and 95 miles south-west by west of Rawalpindi.

2.—LAY OF THE LAND.

Three or four oil springs lie within a distance of about 50 yards along the banks of the Chhota Kutta close beside the water's edge, at most some six feet above its level, which is about 1,450 feet above sea-level. The main spring is about midway between the uppermost and lowermost ones. They are just at the outlet (north-eastern end) of a narrow gorge square across the north-easternmost of the higher ridges of the Salt Range, running here north-westerly, and this ridge rises steeply on either side of the brook to a height of 600 or 700 feet, and within a mile or two to twice that height. The land north-east of the ridge is much broken into low hills, up to some 200 feet in height, growing gradually lower towards the great plain to the north-east. South-west of the main ridge there is a valley half a mile wide, bounded by a still higher ridge on the south-west, and the Chhota Kutta has its head in this valley up towards the north-west.

3.—GEOLOGY.

a. Structure.—The rocks that form the high ridge by the oil springs lie in the form of a saddle, with a dip of about 60° at the springs, and some 5° more in the gorge 60 yards south-west. The axis of the saddle crosses the brooks about 220 yards above the main oil-spring. A dozen yards from the axis the north-easterly dip is 51° and 25 yards from the axis on the other side the south dip is 73°. On either side, however, the dip soon lessens from the outcrop of the oil-bearing beds to 45°, and a third of a mile north-west of the oil springs even to 30°.

b. Rock Beds.—The following is a very rough section of the rocks exposed within a quarter of a mile of the oil spring. Downward :—

Greenish gray sand rocks and shales	about 190 feet.
Greenish gray sand and silbert pebble rock	10 "
Greenish gray sand rock (and shales?)	125 "
Brown pebble rock	4 "
Greenish gray sand rock and shales?	316 "
Greenish gray sand rock	30 "
Dark red shales	25 "
Greenish gray sand rock (with red shales at bottom)	75 "
Brown fine pebble rock	6 "
Red clay	6 "
Gray soft sand rock	3 "
Greenish sand rock and shales	10 "
Gray shales	25 "
Greenish gray sand and fine pebble rock	6 "
Red and greenish gray shales alternating	64 "
Blue gray (weathering brown silbert and larger pebble rock)	5 "
Greenish gray sand rock and shales, with some fine pebble rock and red shales	900
Blue gray lime rock (and perhaps some gray shales), with nummulites, echinoderms, and other fossils	500
In all	1,400

The top of the section is only some 150 feet below red and gray clays that seem to be the same as those of the upper part of the Aluggud group of rocks, and the greenish gray sand rock not only seems to hold the same place as the lower rocks of that group but to resemble them closely in appearance. But both the sand rock and the clays above have at Chhota Kutta been commonly called of Siwalik age, while the rocks below the clays at Aluggud have been called carboniferous.

The pebble rock, just above the lime rock, is made up in great part of limy concretions, many of these having water-worn pebbles, as a core. In at least one of these water-worn pebbles, of a pinkish lime-stone different from the gray concretions, was found a nummulitic.

The lime rock at the bottom of the section is the so-called nummulite lime-stone of the Salt Range.

4—OIL.

a. Mode of occurrence.—The oil comes from the cracks of the gray lime rock through a space of about 100 feet, that is, from 50 to 150 feet below the top of the lime rock, and the main spring comes from about the middle of that thickness. There are three oil springs (the uppermost ones) on the eastern side of the brook near the water's edge (under water in the wet season it is said), and a fourth (the lowest one) on the western edge of the brook near where the brook leaves the upper edge of the lime rock; and perhaps some of the pools of the brook that are covered with a film of oil are supplied with it by other springs. These pools of water come from strong and very sulphury springs; and as the water is uninhabitable for fishes and other animals, the bottom and sides of the pools are covered with a thick white, pink, and red leathery fungus-like vegetable growth. The oil upon the pools of the brook is black, the color that comes from exposure to the air; but in the larger springs the oil can easily be seen to be green when it first rises, although even here there is much black or tarry oil. The oil in the springs rises with water, and floats upon it. At two or three of the larger springs holes have been dug, say a foot and a half across and two feet deep. At the main springs gas is constantly bubbling up.

b. Yield.—Last winter the oil from these springs and from those of the Burra Kutta, half a mile south-east, was gathered by a chowkidar every two or three days for three months and the whole amount, according to his account, was about 90 gallons, or an average of about a gallon a day. Since that, however, this gathered oil partly dried up or leaked away, so that there was only about two-thirds as much to be seen at the time of the survey, even if it was not over-estimated at first. It would seem, therefore, fair, on the whole, to take the average yield of Chhota Kutta springs, if skimmed daily, as about three quarts a day, for they yield decidedly more than the Burra Kutta springs.

c. Outcrop.—The outcrop of the oil-bearing bed runs in general north-west and south-east from the springs along the hill side, but with a bend to the north-east at the springs owing to the depth of the hollow there combined with the north-easterly dip of the rocks.

d. Working.—It would of course be best, as at the other Punjab oil springs, to make the first borings to test the oil-bearing bed as near as may be to the springs, but rather towards the dip. The dip of the bed is such that the middle of it lies at a depth of 100 feet at about 75 feet north-easterly from the main spring, 200 feet deep at about 160 feet from the spring, 300 feet deep at about 250 feet distant, 400 feet deep at about 350 feet distant, 500 feet deep at about 450 feet distant, 1,000 feet deep at about 1,000 feet north-easterly from the spring. As the oil-bearing beds amount to a thickness of 100 feet, the middle of them would be at 100 feet deep near the lowermost oil spring on the brook where the upper edge of the beds comes to the surface. This would be a good place to make the first boring, as it would be some 200 feet to the bottom of the beds, and this would be a good test of their capacity at no great distance from the springs nor from the surface, yet where the beds are wholly under cover. Afterwards other borings might be made either deeper and deeper to the dip, or along the outcrop south-eastward towards the oil springs of the Burra Kutta brook on the same beds. From the size of the springs, the thickness of the oil-bearing beds, and from the fact that they continue oil-bearing so far as the Burra Kutta, half a mile off, it seems highly desirable and worth while that borings should be made here.

Gypsum and Sulphur.—On the hill side on the either side of the brook at the springs there is a large quantity of a porous gypsum, seemingly produced by the action of the sulphur water upon the lime rock. It is said also that a great deal of sulphur was formerly gathered here, but none is now to be seen in the old holes on the hill side west of the springs. It is said to have been visible in small yellow particles in the gypsum, and is probably still to be found so below the surface in a fresh hole. There seem to be some thousands of tons of gypsum (perhaps 20); but the amount of native sulphur in it is quite unknown.

5.—SHIPMENT.

The oil gathered here could be carried on camels or mules a mile and a half by a very rough bridle-path (that would need improvement for at least 100 yards near the springs) to Jaba, thence by better and better roads, the worst of them very good for camels, and perhaps even passable for carts, 100 miles and a half to Rawalpindi, in all 102 miles. Calling this eight marches and a half for a camel, and a load of a camel 50 gallons, and his cost Rs. 11 a month, the carriage of oil to Rawalpindi would cost at least 1 anna and 7½ pies a gallon.

7.—BOOKS AND PAPERS.

These springs are mentioned in a "Report on the Salt Range," by Doctor A. Fleming, Journal Asiatic Society of Bengal, Vol. XVII, November 1848, page 517; in a "Report on the Structure and Mineral Wealth of the Salt Range," by Doctor A. Fleming, Journal Asiatic Society of Bengal, Vol. XXII, 1853, No. 1, page 317; in "Notes on the Geology of the Punjab Salt Range," by W. Theobald, Junior, Journal Asiatic Society of Bengal, Vol. XXIII, 1854, No. 7, page 669; in a "Memorandum on Petroleum in the Rawalpindi Division," by Colonel R. MacLagan, R. E., Secretary to Government, Punjab, Public Works Department, Supplement to the *Government Gazette*, 5th February 1862, page 23; in a "Paper on the Geology of Kashmir, Western Himalaya and Afghan Mountains," by Doctor A. M. Verchere, Journal Asiatic Society of Bengal, Part II, No. 1, 1867, page 13; in a "Manuscript Report on the Jaba Petroleum Springs near Kalabagh," by Lieutenant J. A. Armstrong, Executive Engineer, December 1869, on file in the Public Works Department at Lahore, 4 pages; and in a "Manuscript Report of his last season's Field Work in the Salt Range," by A. B. Wynne, P. G. S., Geological Survey of India, 1870, on file at the Office of the Geological Survey of India at Calcutta.

Report on the Burra Kutta Oil Lands, near Jaba, Bunnoo District, Punjab, accompanied by a Geological and Topographical Map of a Rough Survey, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The oil springs on the Burra Kutta brook, near Jaba, Bunnoo District, Punjab, are a mile and three quarters south of Jaba, 10 miles and a half south-east of Kalabagh, and 95 miles south-west by west of Rawalpindi.

2.—LAY OF THE LAND.

The three or four springs lie within a distance of about 60 yards along the western bank of the Burra Kutta brook close to the water's edge at low water, and about on the same level with it, which is about 1,450 feet above sea-level. The main spring, a dozen yards south of the northernmost spring, is just at the outlet or northern end of a narrow gorge that cuts in a crooked but generally south-eastern direction across the north-easternmost of the higher ridges of the Salt Range, running here north-westerly; and this ridge rises on either side of the brook at first with high cliffs, and then steeply to a height of 600 or 700 feet, and within a mile or two to twice that height. The land north-east of the ridge is much broken into low hills, up to some 200 feet high growing rather lower towards the great plain to the north-east. The gap in the main ridge is just at a point where the ridge is double, the north-western part standing a little in advance (north-east) of the south-eastern part, which begins just behind it, and quickly rises to be the main ridge easterly, while the other dies away. The brook comes to the gorge in a south-easterly course after flowing round the western end of this south-western ridge, behind which to the south-east the brook takes its rise in a narrow valley between this ridge and a still higher ridge on the south-west.

3.—GEOLOGY.

a. *Structure.*—The rocks of the ridge at the oil springs lie in the form of a saddle, with a reversed south-westerly dip of about 80° on the north-eastern side

near the main spring, and a like dip in the same direction on the other side of the saddle, just south of the southernmost oil spring. This saddle seems to be the same that is seen at the Chhota Kutta oil springs, half a mile to the north-west, but is much narrower and sharper here than there, and seems to be dying away very fast to the south-east. The northerly dip here as there grows rapidly gentler to about 45° , which continues for a quarter of a mile, and then grows less and less until perhaps nearly level at a distance of a few miles. This saddle seems to be accompanied here on the south-west by a smaller saddle (with dips of 80° or more on the north-east, and 50° or 60° on the south-west), which rides upon the side of a larger saddle still further south-west, with dips of about 60° or more on the north-east, and perhaps 45° on the south-west. Both of these last saddles are within a quarter of a mile of the springs, and they seem to rise south-easterly and take the place of the northern saddle which dies away, and is crowded out by them.

b. Rock Beds.—The following is a very rough section of the rocks exposed within a quarter of a mile or a little more of the oil springs. Downwards:—

Red and greenish gray clays, in all perhaps	about 700 feet.
Greenish gray sand rock (and gray shales?) with some red shales, about 100 feet from the top, and with some layers of fine pebble rock	825 "
Dark red shales	25 "
Greenish gray sand rock (with red shales at bottom?)	75 "
Brown fine pebble rock	6 "
Red clay	6 "
Gray soft sand rock	3 "
Greenish gray sand rock and shales?	10 "
Gray shales?	25 "
Greenish gray sand and fine pebble rock	6 "
Red and greenish gray shales alternating	64 "
Blue gray (weathering brown) filbert and larger pebble rock	5 "
Greenish gray sand rock and shales, with some fine pebble rock and red shales	1,750 "
Blue gray lime rock (and perhaps some gray shales), with nummulites and other fossils	250 "
In all	2,000 "

The red and greenish gray clays at the top of the section are no doubt the same as those near the top of the Aluggud group of rocks; it has commonly been reckoned as of Siwalik age. The greenish gray sand rock and shales would seem to hold the same place as the similar sand rock of the Aluggud group below the clay; but this has been called hitherto carboniferous in age owing to the productus and other fossils found near its top at Aluggud. Here, however, although no fossils have been noticed in the rock, its age must be newer than that of the lime-stone below, and this has from its nummulites and other fossils been called the nummulitic lime-stone. If the Aluggud so-called carboniferous rock be really older than this nummulitic lime-stone, then not only that lime-stone, perhaps 1,100 feet thick in all, but the 1,050 feet of sand rock and shales above it and below the red and greenish gray clays, or more than 2,000 feet in all, must have thinned out and disappeared between Burra Kutta and Aluggud, a distance of only 30 miles.

4.—OIL.

a. Mode of occurrence.—The oil comes from the cracks of the gray lime rock through a space of about 100 feet in thickness, and the main spring comes from about 100 feet below the top of the lime rock. The oil is dark green in color at the main spring when quite fresh from the rock, but in the air quickly becomes dark brown or black and tarry, as it is at all the other places near. The main spring is some six feet long and a foot or two wide, and quite shallow, and other springs are only a foot or two wide. At high water the springs are no doubt quite overflowed. Near the oil springs, as on the Chhota Kutta, there are sulphur water springs, but not so strong ones as there.

b. Yield.—The yield of the springs here amounts perhaps altogether to three pints a day.

c. Outcrop.—The outcrop of the oil-bearing bed comes to these springs in a south-easterly course from the Chhota Kutta oil springs; it seems barely to cross the Burra Kutta brook, then to return westerly and north-westerly again towards the Chhota Kutta. There is perhaps also a small nearly circular outcrop of the bed on the Burra Kutta, about a furlong south-west of the spring.

d. Working.—The springs yield so much oil naturally, and the oil-bearing bed is so thick, that it seems quite worth while to test the oil-bearing bed by boring into it at some distance below the outcrop. Of course it would be best to make the first boring as near as may be to the springs, although the Chhota Kutta oil-springs on the same bed seem to show that it is oil-bearing throughout the space between the two sets of springs. Owing to the steepness, and even reversal, of the dip at the Burra Kutta main spring, a boring close by it would go through the oil-bearing bed for perhaps 200 feet. At a distance of only 60 feet north-easterly from the main spring the middle of the bed would be at a depth of about 200 feet; at a distance of 130 feet about 300 feet deep; at 240 feet distant about 400 feet deep; at 340 feet about 500 feet deep; and so on to 810 distant, where it would be about 1,000 feet deep. The strike of the bed towards the Chhota Kutta springs is about north 53° west, and borings in this direction would be likely to yield as well as at the Burra Kutta.

5.—SHIPMENT.

The oil gathered here could be carried on camels or mules about two miles by a very rough bridle path to Jaba, thence by road, quite good for camels, and growing better and better as you go on, 100 miles and a half to Rawalpindi, say 102 miles in all. Calling this eight marches and a half for a camel, and his load 50 gallons, and his cost Rs 8 a month, the carriage of oil to Rawalpindi would cost at least 1 anna and 7½ pies a gallon.

Report on the Sadcealee Rock Tar Spring, near Nara, Jhelum District, Punjab, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

The Sadcealee rock tar spring, in the Jhelum District, Punjab, is about 90 miles south-west of Rawalpindi, seven miles south-east of Lawa, four miles south-east of Nara, and two miles east of a salt chowki. It was described by a chowkidar of Lawa, one of the very few in that region who had ever seen it, as yielding a very small quantity of a black liquid (tar) that the people there called "Leleera," of whose nature they were quite ignorant. He said that it floated upon the water of a small pool, and covered with a thin film a space of perhaps eight or ten inches in diameter; that he skimmed off some with a stick, and then held the stick over a fire, but that it would not burn, would only hiss and give out smoke. He and the chowkidar of the salt chowki (the latter of whom made little pretence of knowing the way to the spring) tried to show where the spring was, but on getting, as they said, very near to it, were quite unable to point it out. As the dark-colored liquid seemed at the time unlikely to be tar, but rather some vegetable scum upon water, and its quantity was at any rate extremely small, the search was abandoned. After a survey, however, of the Chinnoor, Hungooch, and Dooma rock tar springs, where the tar is called "Lelloora," it was clear that the "Leleera" of Sadcealee was also tar; but as it was also clear that its quantity was quite unworkable, as at those places, it seemed plainly not worth while to try again to find the place. The chowkidars, in trying to find the spring, led to a spot where the gray sand rock was exposed below the red and greenish gray clays, and with a gentle dip northward, all precisely corresponding to what is seen at the other three places. The geological position of the Sadcealee tar and the mode of occurrence, as well as the yield, are beyond a doubt the same as at the other three places. Even if it should be desired to bore here at any future time, the circumstances are so pre-

cisely similar to those at the other three places, that the instructions given for them would also apply here, and no doubt could possibly arise as to the mode of proceedings.

Report on the Chinnoor Rock Tar Springs, near Mirdawal, Shahpur District, Punjab, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

The Chinnoor rock tar springs, in the Shahpur District, Punjab, are 83 miles south-west of Rawalpindi, two miles and a half north-north-west of Mirdawal, and one mile and a half west-south-west of the Hungooch rock tar.

The springs are near the union of two branches of the Chinnoor brook, one coming from the east, the other from the south, while the main stream flows northerly. Between the two forks of the stream the land rises southerly without any great hollows in it, but north of the easterly fork and west of the southerly fork, and on either side of the main stream, hills rise to a height of 300 or 500 feet, with very steep cliffy sides towards these streams, but with a much gentler slope northerly.

The dip of the rock is gentler northerly, perhaps 25° , and its uniformity is the cause of the uniformity and comparative gentleness of the slopes of the surface of the ground in that direction, while the slopes in other directions are extremely steep and irregular. The slope between the two forks of the stream is formed by almost the very uppermost surface of the great nummulitic (bluish gray) lime rock (that of the Jaba group and of the Salt Range generally). The hills on either side of the main stream are formed by the brownish gray sand rock which reaches up to the red and greenish gray clays, exposed a little further north, and is no doubt the same as the thick sand rock in a similar position in the Jaba group.

The rock tar (called here by the natives "Leloora") issues from the rock in these places on the easterly fork perhaps 200 yards above the union of the two forks, on a small branch of this fork about 150 yards west of the first place, and on the northerly fork about 50 yards west of the second place. The tar at the first (eastermost) of these places comes from the lime rock, but very close to its upper surface; at the two other places it comes from the brownish gray sand rock quite near to its lower surface.

The amount of tar at the eastern place is scarcely a ten-spoonful, at the middle place perhaps half a pint, and at the western place at the time of the survey none at all, although some white scum was to be found here like that to be seen with the tar at Hungooch.

The outcrop is easily to be traced along the junction of the said rock and lime rock in a general east and west course; and the uniformity of the dip, as well as its gentleness makes it easy to dig or bore upon the tar-yielding bed at some depth below the surface by going to a little distance northerly from the outcrop. It would, however, be the height of folly to go to the expense even of boring, for it is very clear that the deposit, or rather the three deposits are extremely small ones, limited to a few feet or even inches from the places observed.

Report on the Hungooch Rock Tar Springs, near Dhuddur, Shahpoor District, Punjab, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

The Hungooch rock tar springs, in the Shahpoor District, Punjab, are 81 miles south-west by south of Rawalpindi, and two miles and a half north-west of the village of Dhuddur.

The tar springs are only 25 feet apart in the bed of a brook which flows thence north-westerly. The land rises south and south-easterly of the springs in a comparatively gentle and uniform slope, but on the east and west it rises steeply, and with high cliffs to some 500 feet. From this height the hills slope down rather gently and uniformly northward.

These gentle and uniform northerly slopes correspond to the uniform dip, about 25° of the rocks in the same direction. The lowest rock exposed is the bluish gray nummulitic lime rock of the Jaba group, and it here also contains nummulites. It is exposed here and there all over the hill side south of the tar. Upon the lime-stone, and forming the high hills on either side of the brook is brownish gray sand rock, clearly the same as the great sand rock in the same position at Jaba, and there 1,000 feet thick or so. Above it half a mile north of the tar, is seen the red and greenish gray clays found just above the Jaba group and near the top of the Aluggud group.

The tar issues from the brownish gray sand rock within a few feet of its bottom, and the two springs come from layers about six feet apart. The one from the upper layer is owing to the northerly dip (rather steeper than the slope of the ground), the more northerly of the two, and is the larger, but the whole amount of both together is hardly a pint.

The outcrop of the tar-bearing bed has a general east and west course; but bends round to the south from the springs on either side owing to the presence of the high hills along whose foot it runs near the upper surface of the lime-stone that forms the gentle hill-side between.

As the sand rock that yields the tar is well exposed at the springs, it is plainly seen that the bituminous matter from which the tar comes must be a very small deposit, not only a very thin layer, but almost certainly of very limited horizontal extent. It would therefore be very unwise to make borings here in hopes of finding a greater yield; but uniformity of the dip shows very plainly where borings should be made if it should ever be wished to test the bed at any depth. The bed plunges beneath the surface of the ground at the springs, and would be found uniformly at a greater and greater depth in a northerly direction.

Report on the Dooma Rock Tar Springs, near Kubbakkee, Shahpore District, Punjab, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

The Dooma rock tar springs are on the Wudda Dooma and Nikka Dooma brooks, within 40 yards of their union, which forms the Dooma brook. They are 77 miles south-west by south of Rawalpindi, and three miles and a half north-north-east of Kubbakkee.

The Nikka Dooma (the smaller of the two) comes to the springs from the south-east, and the Wudda Dooma comes from the south-west; the Dooma below the springs has, though crooked, a general northerly course for half a mile at least. The land between the two forks and on either side of the main stream is from 200 to 100 feet higher than the brooks, and has high cliffs along their borders, but above slopes gently northward, generally speaking.

The cause of this gentle and uniform northern slope is the uniform gentle dip (about 7°) of all the rocks in that direction. About a quarter of a mile southerly of the springs is seen the same bluish gray lime rock as that of Hungooh and Chinnoor, and the same as the great nummulitic lime rock of the Jaba group of rocks. It then passes below the greenish gray (brown weathering) sand rock, the same as that of Hungooh and Chinnoor, and as that of the Jaba group. The sand rock is much false-bedded, and in places pebbly. About three quarters of a mile north of the tar springs are seen resting upon the sand rock the red and greenish gray clays (perhaps 700 feet thick), which are seen at those other places, and also near the Aluggud oil springs.

The tar issues from the sand rock very near its bottom, perhaps within 30 feet of it, at four places on the Wudda Dooma within 40 yards of the union of the two brooks, and at one place 24 yards above that point on the Nikka Dooma. All the places are within a thickness of perhaps five feet of the rock, or even less. The tar seems to melt in the sun's heat from a small quantity of asphalt imbedded in the rock, but may perhaps issue first as oil, and then turn to black tar on exposure to the air. At two or three of the

places the tar has dried to asphalt, rather impure from pebbles and sand mixed with it.

There is perhaps a cubic yard and a half of this asphalt in all. The liquid tar amounts to scarcely a trace at the place on the Nikka Dooma, to perhaps a gill at the lower place on the Wudda Dooma, to two spoonful at the next place, to a quarter at each of the other two, making half a gallon in all. Although the yield here is more than at Hungooch, and is spread over a greater space, it seems clear that the yield to be hoped for from a boring would be far too little to pay for the expense.

The outcrop can, however, easily be followed along the base of the cliffs on either side of the streams until it gradually rises southward to their northern face, always close above the lime rock, and takes in general an east and west course.

To bore from the top of the high lands above the cliffs would be very costly owing to the height above the tar or oil-bearing bed; and the only place where it could be reached from a comparatively short distance (without going far from the springs) is in the channel of the Dooma below the tar. A boring, however, is in any case not at all likely to pay for its cost, and the deposit is to be looked on rather as analogous to the little coal beds, of no value, often seen formed by a single plant or two turned to coal.

BENJAMIN SMITH LYMAN,

Mining Engr., P. W. Dept. of the Govt. of India.

Lahore, 5th November 1870.

SUPPLEMENT TO THE REPORT ON THE OIL LANDS OF THE PUNJAB.

*Report on the Loonekee Kussee Sulphur Pits, Kohat District, Punjab, by
BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department
of the Government of India.*

1.—SITUATION.

The Loonekee Kussee (or salt brooks) sulphur pits, in the Kohat District, Punjab, are near the western bank of the Indus, about a mile south-west of Dundee, on the other bank, and about two miles north-east of Choorlukkee Meeshuk, and on the road from this village to Dundee. They are about 900 feet above the sea, and perhaps 100 above the Indus.

2.—LAY OF THE LAND.

The pits are on the northern edge of what is in the main a great plain, but here it is very much cut down in steep-sided hollows, through one of which the Loonekee runs with a south-easterly course to the Indus. From this brook extends eastward for about 175 yards an oval-shaped hollow that is about 50 yards wide, and about 10 feet above the bed of the brook. Around the sides of this little hollow are traces of digging, and the sulphur is said to have been taken in large quantities from the earth here until the region came under British rule. North and south of the hollow the ground rises steeply to a height of 50 feet above the brook. About 150 yards north of the hollow is a low ridge of nodular lime rock; north of that still lower brown sand rock ridges or ledges, and north of them red sand rock and red shales.

5.—GEOLOGY.

The lime rock dips northerly some 60°, and therefore probably passes below the brown and red sand rocks. It seems, then, to hold the place of the lime rock of the Gunda group of rocks below brown and red sand rocks, which are no doubt the same that lie at the Punnoba oil springs in this order below what

seems to be the great nummulitic lime rock of the Salt Range. The lime rock of the ridge near the sulphur pits is grey, nodular, and thin-layered, and contains nummulites, and is therefore of nummulitic age.

But south of this ridge and at the sulphur pits the only rocks exposed lie nearly or quite level, and are plainly of the same older alluvial age as the rocks of the same position and appearance at Gunda along the Seel River, and along the Indus near Mukhud. The following section downwards is exposed in the banks of the Looneeke Kussee, just west of the sulphur pits:—

Gray lime rock, full of holes, and with broken nummulitic lime rock pebbles, up to four inches long	about 5 feet
Pebble rock, in parts hard, in other parts soft	10 "
Salt shales, in parts very rich in salt, and covered with a white crust	10 "
In all	25 "

In the bed of the brook is loose gravel containing also salt, and about a cubic yard of earthy asphalt scattered in spots for a distance of some 30 yards.

Sulphur.—The sulphur was got by sublimation from the loose earth (mostly red and mottled clay) of the pits, and probably occurred in the form of small yellow particles. None of it, however, is now to be seen in the surface earth, and it has probably disappeared by exposure to the weather for a little distance (a few inches at least) from the surface. In order, then, to determine its amount, it would be necessary to dig holes here and there, and to test the amount of sulphur that a given quantity of the earth would yield, and to extend these pits and trials until the limits of the deposit, both horizontally and vertically, had been made out. Such an examination would take more time than would have been compatible with the survey of the Punjab oil lands, to which this visit to the sulphur pits was merely incidental. The extent of the old pits and the traditions of the neighbourhood seem, however, to show that the amount of sulphur here is very large.

Gypsum.—Gypsum is exposed in little crystals in the earth here and there at the sulphur pits; but its amount has been left quite undetermined for similar reasons to the one just given. It would seem, however, to be quite a large amount; but the gypsum, so far as observed, was much mixed with clay and other impurities.

Salt.—The salt shales are exposed with their coating of salt for some 40 yards, and the salt seems to be gathered in all quantities by the country-people. There seems to be nothing approaching a bed of rock salt, and it seems highly unlikely that either the richness of the shale bed in salt or its extent will permit of the manufacture of salt here, except on a very small scale perhaps for the benefit of the immediate neighbourhood.

Asphalt.—The asphalt amounts (so far as exposed) to only about a cubic yard, and is therefore of trifling value. It seems to be a secondary deposit, washed here by the brook, and from what source it came does not appear. It no doubt issued somewhere from the solid rock as oil, then dried to solid asphalt, and then probably was washed by the brook from its original place to the little spots where it is now seen. It may even have formed at one time a small deposit in the older alluvium before this action of the brook, and in this case might be far removed from its original source, as far, say, as from Punnoba.

The amount of the asphalt is in any case so small as to give little encouragement to a search for the oil-bearing rock from which it first issued.

Report on the Punnoba Sulphur Pits, Kohat District, Punjab, by BENJAMIN SMITH LYMAN, Mining Engineer, Public Works Department of the Government of India.

1.—SITUATION.

The Punnoba sulphur pits, Kohat District, Punjab, are about half a mile north-east of the Punnoba oil springs, about three quarters of a mile east of

Punnoba village, about four miles north-west of Choorlukkoe Meesluk, about four miles north of Shekh Khan, and about nine miles north of Khooshialgurh, on the Indus. They are about 1,500 feet above the sea, and about 350 feet above the oil springs.

2.—LAY OF THE LAND.

The pits are on the north-western side of the first (south-easternmost) high ridge of the mountains that border British Territory here next to Afreedeestan, the same ridge in which the oil springs occur at the gorge of the Punnoba brook. The general slope near the sulphur pits is north-westerly, but there are many small hollows cut down with steep sides by the small streams; and the pits are just at the top of a narrow "divide" between two heads of valleys at the point where the main ridge is joined by a small one that runs westerly from it.

3.—GEOLOGY

This smaller ridge is formed by a saddle in the rocks, with dips of about 45° on either side. The rocks of the main ridge at the one or two points where they are exposed (about 150 yards south-west of the pits) dip about 45° south-easterly. Above the rocks that show these dips is in places a certain amount of loose earth or rock, with no dip that can be made out.

This loose stuff is partly bright red earth and partly gypsum, and perhaps partly gravel. The rocks that show the dips are gray limestone, no doubt the same as that of the Punnoba oil springs, of nummulitic age, and probably the same as the great nummulitic lime rock of the Salt Range.

Sulphur.—The sulphur has not been dug here for some 20 years, since the British rule began; but there are still traces of a number of small holes within a space of 15 or 20 yards across. The sulphur is not now to be seen in the earth here at the surface, but has probably disappeared merely from the action of the weather. It probably occurs in the form of small yellow particles scattered through the earth and gypsum, and it was formerly got from them by sublimation. The amount of sulphur that a given quantity of earth would yield is quite unknown, and the extent and depth through which the earth yields it is not known. Until these points are tested by digging at numerous points and trying the richness of the earth at each of them, it will be impossible to estimate the amount of sulphur that exists here. The delay of such an examination would have interfered far too much with the progress of the oil survey, and was therefore not undertaken. Although the holes seem much fewer, and within a narrower space than those of Loonekee Kussee, it may be chiefly owing to the less convenient accessibility of the place, and it is very likely that a large amount of native sulphur is scattered through the gypsum.

Gypsum.—Southerly from the sulphur pits and close to them rises upon the side of the main ridge a little hill that seems to be wholly made up of porous crystalline gypsum, similar to what is seen near the Chhota Kutta oil springs of Jaba in the Salt Range, about 10 miles east of the Indus. In both cases the origin of the gypsum is probably the same, namely, the effect of the water of a sulphur spring upon the gray nummulitic lime rock. This little hill of gypsum at the Punnoba sulphur pits rises some 75 feet above the pits, and the gypsum reaches to 100 yards or so south of them, and runs some 75 yards or more east and west. There are, then, perhaps 200,000 tons of gypsum here, but more of it may be hidden under loose gravel near by. The inhabitants of the region seem quite ignorant of the great value of the gypsum for its various uses, and it lies quite neglected.

BENJAMIN SMITH LYMAN,

Mining Engineer, P. W. Department.

Calcutta, the 25th November 1870.

No. 92, dated 12th October, 1866

From—T. E. B. BROWN, Esq., M.D., Chemical Examiner, Punjab,

To—The Secretary to the Government of Punjab, in the Public Works Department

I have the honour to acknowledge the receipt of your office letter No. 99C,

dated 19th July, and of the petroleum referred to in it, and to state concerning the latter, that I find it to be as follows:—

A greenish black fluid when examined in mass, but greenish red when looked at in thin layers, with a peculiar, rather unpleasant smell; its specific gravity is 931. It is not very inflammable, as it may be heated up to the temperature of 220°, or above the boiling point of water, without catching fire, even when a light is brought near it, but at 230° Fahrenheit it catches fire from any naked flame, and burns with a bright white light, giving off an abundant black smoke, which settles on any cool surface, forming carbon or lamp-black mixed with water. This proves that the substance is composed of carbon and hydrogen, but that it contains no oxygen is shown by the fact that not only is the metal potassium not ignited by contact with this petroleum, but that even if globules of potassium are thrown into a vessel containing both petroleum and water, they will be ignited by contact with the water, but immediately extinguished on rising into the petroleum.

The above experiment indicates that petroleum has great power in preventing oxidation in metals, or rusting, as it is called, when referring to iron, and combined with its oily qualities, indicates that it would be useful in lubricating machinery and preventing the corrosion of iron, and it has been found useful for lubricating machinery in America.

If the petroleum is heated to 230° Fahrenheit it will take fire on a light being applied, and burn with a bright flame, giving out much heat; this flame is not easily extinguished by the addition of water, but can be at once arrested by covering over the vessel, and thus stopping the influx of air. Petroleum has been largely used as a fuel in steamers. It is stated in the "Scientific American" that the volume of flame of petroleum was so great as to pass entirely through the tubes of the boiler and heat the smoke pipe red hot for several feet from the base.

The time of generating steam from water of equal temperature to 20 lbs. pressure above the atmosphere was for the oil, an average of 20 minutes, and for the coal, 60 minutes, or in favour of the oil, 14 per cent. One of our iron-clads, by its successive use, would be able to keep the sea under steam three times as long with less labour and greater convenience as compared with the use of coal, equal weights of each on board being considered.

It is also stated that a frigate which can carry 10 days' coal costing about £1,000 could carry 20 days' petroleum costing £500.

If the petroleum be carefully distilled, a clear reddish fluid comes over, from which, if shaken with 5 to 10 per cent. of strong sulphuric acid and then allowed to rest for 24 hours, a dark fluid subsides, and the upper liquid becomes yellow; if this is then mixed with caustic lime and distilled, a nearly white volatile oil passes over, which has the appearance and all the properties of kerosine, and might be burnt instead of that substance in the proper lamps.

It is stated in the papers that kerosine lamps are ordered to be used in barracks in Bengal, and it is, without doubt, a clear, brilliant light and economic when the kerosine is procurable at a low price.

If the petroleum is allowed to flow slowly into an iron vessel heated to nearly redness, it is rapidly converted into a pure carburated hydrogen gas, which burns with a bright white flame; this I have prepared, and find that the process can be easily performed. It is stated also that the residue, after gas so obtained, contains much paraffine, and may be used for the preparation of candles, but I have not yet succeeded in effecting this, as it requires extreme cold to separate the paraffine.

It is also stated with respect to the American petroleum, that paint oils and varnishes are also prepared from it, and the benzine (*i.e.*, the liquid called kerosine) is used as a substitute for oil of turpentine. Some of the most beautiful and durable colours now worn are obtained from the waste petroleum, after refining, and after the separation of the naphtha; it has likewise been found a valuable substitute for pit oil in tanning, and produces a better and stronger quality of leather.

It is also recommended in medicine, to be used in skin diseases, and it has been employed at the hospital under my charge, with effect in some of these.

Mixed with powdered kunkur, it forms a solid substance which does not melt in a fierce sun, but can be spread by a red hot iron into a smooth surface, impervious to water. This deserves a trial on a roof, with respect to its powers of rendering houses water-proof in the Punjab, and if sufficient petroleum be sent I will have much pleasure in superintending this.

In cold climates, petroleum, boiled and mixed with lime, is used as a pavement, but I greatly doubt its applicability to this use under the burning sun of the Punjab.

Lastly, I would state that I believe there is little danger in storing petroleum of this kind, since it is stated that petroleum which does not ignite when poured on water heated to the temperature of 200° , and a flame applied, may safely be kept, while the specimen sent to me did not ignite even at 220° , but it is possible that other specimens may be more combustible than the above sample.

The experiment of pouring the oil on boiling water, and applying flame to it, can, however, easily be tried.

Dated 21st December, 1866

From T. E. B. DRAKE, Esq. M.D., Chemical Examiner, Punjab.

To The Secretary to the Government of the Punjab in the Public Works Department.

The constituents of American petroleum are numerous compounds of hydrogen and carbon, similar in composition to marsh gas, but most of them are liquids. It also contains paraffine, a solid of the same nature.

The Hydrocarbons are as follows:—C standing for Carbon, and H for Hydrogen.

			SAFETY GRAVITY	BOILING POINT
Hydride of Ethyle,	C 4, H 6		Gas.	..
" of Propyle,	C 6, H 8		"	..
" of Butyle,	C 8, H 10		600	39
" of Othyle,	C 10, H 12		628	86
" of Caproyle,	C 12, H 14		669	154
" of Octomethylene,	C 14, H 16		669	198
" of Caproyle,	C 16, H 18		726	242
" of Elaeine,	C 18, H 20		741	278
" of Parameylene,	C 20, H 22		757	320
	C 22, H 24		766	361
	C 24, H 26		778	392
Unnamed	C 26, H 28		792	422
	C 28, H 30		Not as- certained	464
	C 30, H 32		"	500

Besides these, it contains paraffine, a solid hydrocarbon, which varies in composition, but is usually C 54, H 56.

It always contains two proportions of hydrogen more than the proportions of carbon, as the above series of liquid hydrocarbons do also.

2. I regret that I have not the means of separating these various substances at present, but from the different temperatures at which the Punjab petroleum boiled, and the fact that it contains carbon and hydrogen only, there is a great probability that most of these hydrocarbons would be found in this petroleum with the exception of the first three.

These all boil at a very low temperature, and are inflammable at the ordinary temperature of the air. I have never found any such vapours given off from the petroleum sent to me, but as that has probably been obtained from the surface, and therefore exposed to the high temperature of our summers, it is probable that the liquids which boil below 112° would be driven off, and it is quite possible that such easily inflammable vapours might be found in petroleum taken from a greater depth in the earth.

Note by MR. H. B. MEDLICOTT, Superintendent, Geological Survey of India, dated 17th July 1883.

Mr. Lyman's judgment on the Punjab petroleum can by no means be taken as final, except for the supply within shallow depths; although his

apparent reserve upon the question of deep borings seems really to amount to an adverse opinion when looked at through the very dogmatic views he enunciates as to the origin and distribution of the oil. At page 8, paragraph 4 of his report (in India), he makes out that the average extent in depth would be only about half the length of the oil-bearing outcrop, and having found this in every case to be small, he implies that the extension in depth would correspond, but such a limitation of a fossiliferous (oil-producing) deposit is quite inadmissible.

In previous paragraphs he gives a crude discussion upon the mode of origin of petroleum, and announces as a "now well established fact" that the oil is only found in the holes in which it was first formed by the slow decomposition of organic remains. Now it is absolutely certain that petroleum and its derivative asphalt occur extensively in cracks and fissures in which it cannot have thus originated, and such a mode of distribution is all the more likely in rocks so disturbed as those of the Punjab oil region. For the same reason the lighter oils seldom occur in such rocks.

Mr. Lyman had probably only worked in the flat oil-measures of the Eastern States. The man to try the Punjab ground should have worked in troubled rocks, as in California.

Nothing but boring trials will decide the question.

The geological description of the ground will be found in Mr. Wynne's Salt Range reports, *viz.* :—

Trans-Indus.

Memoirs, G. S. L., Volumes XIV and XVII, Part 2.

Mr. Wynne's note on the tertiary zone and underlying rocks in North-West Punjab,—Records, Volume X, Part 3.

But Mr. Lyman's *original* report *with the 11 plans*, give the most practical view of the nature of the ground.

Note by Mr. H. B. MEDLICOTT, Superintendent, Geological Survey of India, dated 15th August 1883.

The note I appended to the petroleum file points out not only that Mr. Lyman's report gives no direct opinion upon the main feature of the case, the occurrence at greater depths, but also that the theoretical views he records bearing upon that point are demonstrably erroneous, 1st, the accumulations of fossils in circular patches from which he deduces the rule that the local limit of depth of an oil-bearing bed is equal to half the length of its local outcrop—the notion is untenable; 2ndly, his contention that the occurrence of oil out of the bed in which it was formed is quite an exceptional phenomenon—is scarcely less opposed to nature and experience. That oil will remain indefinitely in its original bed so long as this is undisturbed is likely enough; but that in contorted and broken rocks oil will not obey the laws of fluids and go where pressure or gravitation leads it would be too much to expect, and the fact of its being extensively found in cracks and fissures is quite beyond question.

The oil rocks of the Punjab are greatly disturbed and broken, and I should think that scarcely any of the original oil beds have escaped the action of underground drainage.

What I say is, that Mr. Lyman's report leaves us no wiser than we were before as to the oil resources of the Punjab. Oil-forming conditions seem at least to have been very widespread there; and as well as I can judge from published accounts, oil has been found abundantly by deep boring where the surface symptoms were not better than these. I am therefore decidedly of opinion that Government should not abandon the investigation. Large sums have recently been spent there in a search for coal where the chances of success were indefinitely less, indeed, in my opinion, *nil*. As for recommending any particular site for boring, it will be understood from what I have said regarding its probably promiscuous mode of occurrence in broken ground, that scientific judgment would be of very little use. It is just the case where the instinct formed by experience would be the only guide, so it would be a pity not to give the undertaking the benefit of such experience.

GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.
RAILWAY TRAFFIC.

No. XXXVII of 1888.

APPROXIMATE STATEMENT OF GROSS RECEIPTS AND EXPENSES OF INDIAN RAILWAYS.

Latest returns received	Railways.	Total length open.	Receipts for week ending 31st September 1888		Total length open.	Receipts for week ending 31st September 1888		Total Receipts from 1st April to 31st September 1888		Total Receipts from 1st April to 31st September 1888		Total Increase in 1888-89.	Total Decrease in 1888-89.
			Total.	Per mile open.		Total.	Per mile open.	Total.	Per mile open.	Total.	Per mile open.		
	Guaranteed.												
20th Sept. 1888	Eastern Bengal	172	1,91,463	1,110	172	(a) 1,19,567	695	21,76,044	673	(a) 21,49,825	609	...	3,26,219
22nd ditto	Oudh and Rohilkhand	547	74,175	136	547	92,852	170	23,70,366	172	27,88,056	204	4,17,689	...
22nd ditto	Sind, Panjab & Delhi	676	1,60,918	238	749	1,74,017	232	14,30,747	200	65,89,641	300	11,50,891	...
22nd ditto	Madras	861	1,31,402	153	861	1,21,827	141	31,37,534	163	31,87,622	148	...	2,10,902
22nd ditto	South Indian	656	70,638	108	656	77,170	118	18,81,570	115	19,51,367	119	69,788	...
20th ditto	Great Indian Peninsula	1,451	4,08,604	282	1,451	4,34,405	299	1,52,69,440	119	1,61,53,298	445	8,83,762	...
22nd ditto	Bombay, Baroda and Central India	461	75,955	165	461	1,48,731	323	46,75,159	104	51,03,400	469	7,28,244	...
	TOTAL	4,823	11,13,236	231	4,823	11,68,628	239	3,45,40,865	230	3,72,23,131	301	26,82,266	...
	State.												
29th Sept. 1888	East Indian	1,507	7,14,181	474	1,507	8,17,816	542	2,06,65,112	515	2,44,60,920	646	37,95,808	...
28th ditto	Calcutta and South-Eastern	38	8,056	93	56	5,150	92	90,583	116	1,41,544	106	50,961	...
29th ditto	Nalhati	27	1,237	46	27	1,334	49	32,510	49	39,390	59	7,477	...
29th ditto	Northern Bengal	230	49,487	215	239	42,640	178	9,03,421	166	9,73,752	166	70,331	...
32nd ditto	Tirhoot	75	10,718	143	166	17,380	106	3,07,895	151	4,09,370	100	1,01,476	...
25th Aug. 1888	Patna-Gya	57	10,336	181	...	(b) ...	...	(c) 1,82,914	152	(a) 1,63,765	137	...	19,146
29th Sept. 1888	Cawnpore-Achuar	138	10,318	75	138	8,350	60	2,51,302	72	2,59,462	75	8,160	...
29th ditto	Dildarnagar-Ghaziपुर	12	668	56	12	456	40	22,038	73	22,748	76	708	...
29th ditto	Rajputana-Malwa	1,116	1,37,811	123	1,117	1,86,490	167	48,98,577	172	57,16,621	205	8,78,044	...
29th ditto	Wardha Coal	45	6,424	143	45	8,147	181	2,45,462	217	3,37,020	300	91,558	...
29th ditto	Nagpur & Chhattisgarh	96	4,604	47	149	7,774	52	2,60,974	106	6,28,004	169	3,67,030	...
22nd ditto	Bangalore and Iravaddy Valley	161	20,205	135	161	20,804	129	6,50,163	161	6,54,818	163	4,655	...
29th ditto	Sindia	75	4,583	61	75	4,667	62	1,47,012	78	1,46,801	78	...	1,211
22nd ditto	Punjab Northern	409	46,343	113	421	51,926	123	13,69,821	135	14,91,338	142	1,21,517	...
29th ditto	Indus Valley and Kandahar	660	67,574	102	660	1,05,313	157	20,00,732	120	35,65,313	216	15,64,581	...
29th ditto	Kaunia-Dhule	32	2,250	70	32	2,208	69	36,898	46	48,106	60	11,208	...
29th ditto	Hewari-Ferozepore	...	...	...	29	7,000	79	...	...	1,70,936	77	1,70,936	...
	TOTAL	9,169	3,76,617	119	9,387	4,67,673	138	1,13,40,641	142	1,47,68,486	171	34,27,844	...
	Assisted Company.												
29th Sept. 1888	Bengal Central	...	...	...	35	1,938	55	...	...	52,523	60	52,523	...
	Native States.												
22nd Sept. 1888	Bhavnagar-Gondal	194	11,112	57	193	10,545	55	4,37,600	90	4,78,660	89	41,060	...
22nd ditto	Nizam's	121	16,408	127	121	19,577	162	4,13,254	136	3,77,130	125	...	36,148
22nd ditto	Mysoor	86	4,610	54	86	5,137	60	1,35,204	63	1,29,089	59	...	9,115
22nd ditto	Jodhpore	19	929	49	19	410	23	(f) 7,121	29	18,689	39	11,568	...
	TOTAL	420	32,060	76	419	35,669	85	9,93,179	97	10,00,543	96	7,364	...
	GRAND TOTAL	9,519	22,95,098	225	(g) 10,206	24,91,864	223	6,75,30,097	272	7,76,05,697	301	69,65,500	...
	GROSS ESTIMATED EXPENSES	...	...	...	...	...	...	3,50,02,735	141	3,05,10,932	164	...	...
	NET RECEIPTS	...	...	...	...	...	...	3,25,27,362	131	4,70,94,765	137	64,57,808	...

(a) Exclusive of the Company's share of the earnings of the Bengal Central Railway.
(b) Return not received.
(c) Total receipts from 1st April to 20th August 1888.

(d) Total receipts from 1st April to 30th August 1888.
(e) Exclusive earnings of Patna-Gya State Railway (57).
(f) Total receipts from 1st June to 31st September 1888.

R. A. SARGAUNT, Major, R.E.,
Offg. Under-Secretary.

SIMLA,
14th 13th October 1888.

GOVERNMENT OF INDIA.
LEGISLATIVE DEPARTMENT.

BENGAL TENANCY BILL.

No. 184-1161L., dated 1st May, 1893.

Office Memo. from—The Offg. Under-Secy. to the Govt. of India, Revenue and Agricultural Dept.,
To—The Secretary to the Government of India, Legislative Department.

The undersigned is directed to forward, for consideration by the Select Committee in charge of the Bengal Rent Bill, copies of the papers noted in the margin, regarding rent rates in Darbhanga, Murshidabad, Shuhabad, &c.

Bengal Government No. 111L.R., dated 3rd March, 1893.
Do. " 111L.R., dated 3rd March, 1893.
Do. " 111L.R., dated 3rd March, 1893,
and enclosures.

Endorsement by the Officiating Under-Secretary to Government, Bengal,—(No. 111L.R., dated 3rd March, 1893).

Copy, with copies of the enclosures and the plan in original, submitted to the Government of India, in the Department of Revenue and Agriculture, for information, in continuation of my endorsement No. 111L.R. of this date.

The return of the original plan is requested.

No. 121A, dated Calcutta, the 19th February, 1893.

From—H. J. S. Cotton, Esq., Secretary to the Board of Revenue, L.P.,
To—The Secretary to the Government of Bengal, Revenue Department.

In continuation of the Board's letter No. 23A., dated 8th January, 1893, I am directed to submit copy of a report (with enclosures), dated 10th February, 1893, from Mr. M. Finucane, on the result of the enquiries made by him in the villages of the Narhan estate as well as in those belonging to other zamindars of pergunnah Sureysa, and to observe as follows:—

2. In paragraphs 4 and 5 of his report, Mr. Finucane has adopted the convenient plan of summarising his conclusions, and they need not be here repeated. The statements contained under head VI of paragraph 4 of the report justify all that has been said as to the evil effects of the Behar system of thikadari leases and the extortionate demands made under it.

3. It is impossible for the Court of Wards to interfere effectually on behalf of the ryots of the villages of the Narhan estate, which are leased to the manager of the Dabing-erai factory until the farming leases expire. The Commissioner might, however, remonstrate with the manager of the factory against his enhancements. The recent so-called temporary enhancement of rents, as explained by the manager in his letter, which is extracted in the margin of paragraph 11 of the memorandum on mouzah Tubka khas, seems to have been most inconsiderate. If the produce of the lands which paid their rents in kind was short, presumably the produce of the lands which paid money rents must have been short also, and the enhanced demand must have pressed severely on the ryots. Head IX of paragraph 5 of the report shows that the special measures, which have all along been recognized as necessary for Behar, are indeed required.

4. From clause 1 of paragraph 4 of the report it will be seen that the ryots are able to resist excessive enhancement of rents if they are well advised.

5. Head III of paragraph 5 of the report shows that there exist the same difficulties in the way of framing tables of rates in other estates as in those of the Narhan ward. It will be observed that the average rate of rent in the ward's estate is below that which prevails in neighbouring properties.

6. The remarks made in paragraph 6 of the report regarding village Jazpotee show that lightness of the Government demand is no factor towards preventing excessive demands of rent.

7. Mr. Dampier agrees with Mr. Finucane that the state of things existing in North Behar, as brought out in his present report and compared with that existing in South Behar, Lower Bengal, and in the North-Western Provinces, calls for the introduction in the Rent Bill of a provision for a reduction of the existing rents where they are found to be excessive, and also for provision to check arbitrary enhancements. If the extension of this latter provision to any district, part of a district, estate or tract were left optional to the Government, the knowledge that such a power might be exercised would act as a check upon landlords inclined to excessive enhancement of rent. Such a check against arbitrary enhancement, as

is proposed, is provided in the twenty-second and following sections of the Oota Nagpore Landlord and Tenant Procedure Act I (B. C.) of 1879.

8. The most convenient method of making the landlords file jumabundis, as proposed in clause 1 of paragraph 7 of Mr. Finucane's report, would be to order a re-valuation of the district under the Rent Cess Act, by which procedure the knowledge that cesses will be assessed on the jumabundi filed under that Act, provides a check against the insertion of rates in excess of what are really payable.

9. The Board are separately considering in the Wards Department whether any steps should be taken in the direction of reducing rents in the villages of the Narhun estate, which are held khas.

10. In paragraph 7 (a) of his letter Mr. Finucane writes that the ryot must take the initiative and assert his rights in courts before he can get the benefit of the restrictions on enhancements proposed by the Rent Law Commission. This is not strictly correct as a general proposition. Proceedings for the settlement of the land revenue show that the ryot has only to remain passive under the first demand of enhanced rent. The landlord must then sue him for the enhanced amount of rent, and the ryots would only have to plead those restrictions.

11. It is only in the case of enhanced rent recorded under the Bengal Settlement Act VIII of 1879 as payable to a landlord by a revenue officer in the course of proceedings for the settlement of the land revenue that the amount so recorded is binding against the ryot, unless he contests the enhancement in the courts. The suggestion made in paragraph 8 of the report, that the Board should be empowered to declare that the tables of rates or other authoritative declarations in connection with the determination of rents payable shall be in force for thirty years instead of ten, might also be adopted to meet the extreme cases contemplated by Mr. Finucane.

12. The line of distinction which Mr. Finucane in paragraph 9 of his report represents to exist in the minds of the Behar zamindars and ryots generally, between ryots of ancient standing and other ryots, is just what Mr. Dampier himself represented some twenty years ago in a report on the working of the Rent Act of 1859 from his experience as Collector of Tuluot. He then said that thirty or forty years' tenancy rather than the twelve years period of the Rent Law might be taken as representing the ill-defined line of distinction which existed in the ideas of zamindars and their tenants between ancient ryots who are entitled to special consideration, and other ryots who are not entitled to any such consideration.

Dated Camp, the 10th February, 1893.

From—M. FINUCANE, Esq., C.S., on Special Duty.

To—The Secretary to the Board of Revenue, L. P.

I have the honour to report that, since submission to the Board of my last report, I have again gone over tract II, pergunnah Sureysa, of which I forwarded a map with my letter of the 18th December, and that I have made detailed enquiries regarding the history of enhancement of rent in each village, the facilities for communication and irrigation, number of non-occupancy and occupancy ryots, &c. I have also made enquiries from patwaris of villages appertaining to the estates of other proprietors, which are intermixed with Narhun villages, regarding amount and number of rates prevailing in them, but I have not gone into villages of this class for the purpose of making enquiries on the spot, as I have not been able to obtain the zamindar's consent to my doing so.

- | | |
|-------------------------------|-----------------------|
| (1) Tubka Khas. | (5) Kookan. |
| (2) Tubka Anglathier. | (6) Tubka Kishampore. |
| (3) Mahamedpore Sam-
kara. | (7) Raghupore. |
| (4) Dalsingpore. | (8) Gangoolie. |

2. I now beg to forward copies of the notes which I have made on each of the villages noted in the margin.

3. It will be seen that two mehals included within the tract were brought under permanent settlement in 1242 to 1247 F.S. (1835 to 1840 A.D.)

Na Khas & Hages.

- (1) Tubka Khas
(2) Surowlee

Villages of other zamindars.

- (1) Panoda pore.
(2) Jueypore

The settlement papers which have been received from the Darbhanga Collectorate make it possible to institute a comparison between the rates and prices prevailing at the time of settlement (1840) and those prevailing at the present time. The areas under cultivation in 1840 A.D. in the villages noted in the margin are given in these papers, while in the case of other villages only the prevailing rates are given.

Facts established regarding
Narhun villages.

4. The following facts seem to me to be established from the village reports and statements now submitted.

(a) As regards the rates and rentals of Narhun villages—

I.—That of the two villages of the Narhun estate, Tubka Khas and Surowlee, for which data for comparison are available, cultivation has extended during the past 45 years by 47 per cent. in one and by 39 per cent. in the other, while the gross rental has in the same period increased by 321 and 269 per cent. respectively. (*Report on village Tubka Khas appended.*)

II.—That while the average rise in prices of staple crops for the past forty-five years has been only 73 per cent., the increase in rent-rates in these villages has been respectively 188 and 164 per cent.

- III.—That as regards all the villages in this tract appertaining to the Narhun estate (shown in statement I), there has been an average increase in rates of 136 per cent. during the past forty-five years, the rise in prices in staple products during the same period being only 73 per cent. (*Statement I annexed to this report.*)
- IV.—That there having been no increase in productiveness of soil, the only ground for enhancement of rent-rates was rise in prices.
- V.—That the enhancement in gross rentals and in rent-rates has therefore far out-run the rise in prices.
- VI.—That these enhancements were arbitrarily made by tikkadars during the lifetime of the late proprietor on each recurring septennial renewal of their tikka leases without reference to increase or decrease in prices, and that such enhancements were not regulated by law nor controlled by custom. (*For a specimen of the arbitrary way in which these enhancements were made, the annexed reports on Dalsingserai and Muhomelpore Santuka villages may be referred to.*)
- VII.—That such arbitrary enhancements are even now being made by the manager of the Dalsingserai factory in villages leased to him. (*See annexed reports on villages Tabka Khas, Tabka Mugherhee, Tabka Krishanpore, and Baghpore.*)
- VIII.—That inasmuch as good lands near village sites have been taken up for indigo, and inasmuch as ryots' cultivation has, for that and other reasons, extended to inferior outlying lands, it follows that not alone are the rates all round now paid two to three times the rates paid forty-five years since, but these higher rates are paid for land which is, on an average, inferior to the land for which lower rates were formerly paid.
- IX.—That this state of things is peculiar to North Behar, and has probably no parallel in any other part of India. (*See report on village Tabka Khas, section 9, headed "Determination of rates," and authorities quoted therein.*)

If fair and equitable rates were now to be fixed by reference to the standard of rates and

If fair and equitable rates were now made out with reference to the rates of 1242-47, great reduction in existing rates necessary.

prices prevailing in 1242 to 1247 F.S. (1835 to 1840 A.D.), existing rates would have to be reduced in the six villages (shown in statement III) by from 19 to 50 per cent. In one village in which the ryots resisted enhancements in court the rates are low, and would have to be enhanced. Taking the other villages together, the reduction would on an average be 39 per cent. on the existing rates.

But though the enhancements made since 1817 F.S. (1840 A.D.) are excessive and arbitrary, it would not be in accordance with law, and possibly it would not be in accordance with equity, to ignore them in now fixing fair rates. In Alipore pergunnah of North Durbhanga it was found that rates had been similarly enhanced out of all proportion to increase in prices within the last 10 years; but it was felt that it would be unjust to the proprietor to suddenly reduce them wholesale. A middle course was therefore adopted, and rates were reduced to the figure at which they stood in 1275 F.S. (1868 A.D.) before recent enhancements were made. I would be disposed to adopt a similar procedure were I called upon to make a re-assessment in this estate.

5. The following facts seem to me to be established regarding rates, which are not the facts established regarding property of the Narhun minor but in which enquiries have been made:—

- I.—That the number of rates varies in one village from a maximum of 95 to a minimum of 1, and that the average number for eight villages is 31.
- II.—That the amount of the rates varies from a maximum of ₹10 to a minimum of 10 annas in the same village, and for all eight villages from ₹15 to 2 annas per local beegah of 3,600 square yards.
- III.—That therefore the same difficulties would arise in framing tables of rates as have arisen in the Narhun property.
- IV.—That as regards two villages, Damodurpore and Jazpotee (see statement II), for which alone the data for comparison exist, the area under cultivation has increased by 31 per cent. in the former village and decreased by 3.9 per cent. in the latter since 1247 F.S. (1840 A.D.), while the rental of these villages has increased by 200 per cent. and 500 per cent. respectively in this same period.
- V.—That while the average rate all round for Narhun villages is ₹3-6 per local beegah of land under cultivation, or ₹5-6-4 per acre, the average rate all round for the non-Narhun villages is ₹3 9-6 per beegah, or ₹5-12 per acre.
- VI.—It follows that the rates in the Narhun estate are somewhat lower than in neighbouring villages, the owners of which, it is notorious, have been enhancing their rents in recent years.

6. The conclusions which suggest themselves to me from the facts disclosed in these conclusions suggested by these reports, and from other facts connected with other estates in North Behar, of which the Board is cognizant, are:—

- 1st.—That provision should be made in the Rent Bill for reducing rents where they are clearly excessive.

2nd.—That provision should be made for the effectual prevention in future of arbitrary enhancement, and that such provision should not, in order to be effectual, depend on the ryot taking the initiative in court.

As the Rent Bill stands no provision is made for the reduction of excessive rents, except in the almost unheard-of cases in which the value of produce or

First suggestion.

That in now fixing fair and equitable rates any former period which the court may deem equitable may be taken for the purpose of comparison, and not alone the period when rates were last fixed.

productive power of the land has decreased since the rates were last fixed. ordinarily the rates when last fixed are presumed to be fair and equitable. Now it is obvious that if the rates when last fixed were rack-rent rates, as they are in many parts of North Behar, a Bill which makes no provision for the reduction of these rack-rent rates, but which does, on the contrary, make provision for their enhancement every ten years, is in reality a Bill *pro tanto* for the perpetuation of rack-rents. Take the instance of village Jazpotee. The present proprietor of this village, Baboo Nundan Lal, has inherited it from his adoptive father, Baboo Brij Behari Lal, who was in possession when the permanent settlement of the mahal was made in 1247 F.S. (1840 A.D.) The area then under cultivation was 106 beghas, the then gross rental, which was taken as the basis of settlement, being Rs. 151, and the average all-round rate being Rs. 1-7 per begha. The Government revenue was fixed on the basis of half assets: and, as the settlement records which I have examined show, the very moderate amount thus fixed was objected to by the present proprietor's father on the ground that the rental of Rs. 151, taken as the amount of assets, was more than the ryots really paid. The objection was, however, overruled, and the settlement was accepted in 1247 F.S. (1840 A.D.)

(a) After the lapse of 43 years what do we find in this village? We find that the area

Area under cultivation in 1847, 106 beghas.
Area now under cultivation shown in the jumabandi, 102 beghas.
Rental in 1247 F.S., Rs. 151.
Present rental, Rs. 905.

under cultivation has decreased by four beghas, while the rental is now almost exactly six times the rental of 1247 F.S. (1840 A.D.) In other words, the average rates all round have been enhanced by 500 per cent. in 43 years, the rise in prices during the same period being at most 73 per cent. There is reason to believe that the state of things existing in Baboo Nundan Lal's property is not very materially different from what exists in other properties in the Durbhunga, Mozufferpore, and other North Gangetic districts of Behar.

The road cess papers show that the rental of Durbhunga generally, when the road cess papers were filed, was 7-2 times the Government revenue, of Mozufferpore 5-8 times, of Sarun 4-5, and of Chumparan 5-2 times the Government revenue. When it is remembered that the road cess papers probably under-stated the true rental, and ignored in many cases karchas and abwals, it will be seen to what an enormous extent gross rental in these districts have increased since the permanent settlement. This enormous increase is, I think, mainly due to arbitrary enhancement in rent-rates, and not to extension of cultivation, for we are told that "Behar (at the time of the permanent settlement) was one of the most fertile, highly cultivated, and populous provinces of Hindustan in proportion to its extent of plain, arable land (*Supplement III, Historical and Comparative Analysis of the Finances of Bengal, by James Grant, 5th report, page 501, Madras edition.*) If the net income of zamindars was represented by one-tenth of Government revenue at the time of the permanent settlement, the road cess papers would show that, while the surplus now realised by a zamindar of Burdwan over his Government revenue is only five times, and that of a Dinagapore zemindar only twice the net income enjoyed by his predecessor at the time of the permanent settlement, the surplus realised by a zamindar of Durbhunga from his ryots is now thirty-eight times the surplus over Government revenue which was realised by his predecessor.

(b) When we find that the rents paid by occupancy ryots in Moorshedabad and Shahabad

Mr. Tabin's and Tabin Farukty Churn Roy's reports. have not been changed for 40 years; that the rents in the Government estates of Khoorda, Majumoota, and Jellumoota also have not been changed for 40 years; and that now, after 40 years' respite from enhancement, the ryots of these latter estates are asked for an enhancement in rates of only 50 per cent.; when we further find that the rates paid by occupancy ryots in the North-Western Provinces have

See report on village Tuhka. Also remained practically unaltered for 40 years; when we know that the Madras Government has not raised the assessments on its ryots to anything like the amount which would be justified by a rise in prices; when, in fine, we find this is the state of things in other provinces, and then, contrasting it with parts of North Behar, find that here the rents of occupancy and non-occupancy ryots alike have been raised by from 100 to 500 per cent. within the last 45 years, while prices have only risen by 73 per cent. during the same period, it is not unreasonable to conclude that some provision should be made for reducing excessive rents in Behar, and for giving the people rest from further harassment for a reasonably long period.

(c) I would therefore suggest that some such provision as the following be inserted in section 25 of the Bill, as one of the grounds for the reduction of rent, namely, that rent may be reduced:—

(4) "On the ground that the rent now bears a higher ratio to the value of the gross produce than the rent at any former period, which the court may think it equitable to take for the purpose of comparison, bore to the value of the gross produce at such former period."

The effect of such a provision in fixing rates in the case of Jazypotee would be that the court might, taking the rates of 1217 P.S. (1840 A.D.) for the purpose of comparison, now fix rates by allowing only an enhancement proportionate to the rise in prices since that time, instead of taking the rates last fixed as its starting point, as it is bound to do under the present Bill. Some such provision as I have suggested would enable the courts to do practical justice, while the Bill, as it stands, will only perpetuate present excessive rents and facilitate the enhancement of them.

7. On the second point, namely, the effectual prevention of arbitrary enhancements in future, I would suggest that to the limitations on enhancements, provided in section 33 of the Bill, the following be added:—

That pending the completion of a cadastral survey the rates paid by occupancy ryots be now ascertained by making it compulsory on zamindars to file the jummalbandis of one year in the Collector's office, and that the rates paid by the occupancy ryots when thus ascertained shall not be enhanced, except (a) by an order of a court, (b) or by a written agreement registered under the Registration Act.

(a) Mr. Worsley proposed that this provision, which was taken from the Oudh Rent Act, should be extended to Behar, and the proposal was approved by the Behar Rent Committee. Though the proposal was considered of special importance by the Behar Committee, it was passed over without notice by the Bengal Rent Commission. I venture to think that it is the only limitation which is likely to have the least practical effect in preventing arbitrary enhancements in Behar. The limitations provided in the Bill of the Commission, namely, that (a) an enhanced rent shall in no case exceed 25 per cent. of the value of the gross produce, (b) that the new rent shall not be more than double the old rent, and so on, would have some effect in stopping arbitrary enhancements, if the ryot were a free agent, and were able to assert his rights in court. But if the ryot were thus capable of asserting his legal rights in court, is it possible that he would have submitted to the enhancements to which he has been subjected? Now, in order that the restrictions on enhancements proposed by the Bengal Commission may have any effect in preventing arbitrary enhancement, the ryot must take the initiative and assert his rights in Court; and as there is no more reason to suppose he will do this in the future than he has in the past, I am of opinion that these restrictions in enhancement will, for many years to come, have little or no practical effect in Behar in preventing arbitrary enhancements, which, being imposed at the will of the zamindar or tikkadar, are entered in the village papers by his mere order and without the ryot's consent. Zamindars and tikkadars would find arbitrary enhancements to be a different thing if they were bound to obtain a decree of court or to gather the ryots together at a Sub-Registrar's office and obtain their *bona fide* consent to future enhancements. The way in which enhancements are brought about at present is too well known to require description here. The assent of the village headmen and patwar is first procured by bribes and special concessions to them. The main body of the ryots, finding that their leaders have not resisted, ask: "Who are we that we should resist?" What is everybody's business is nobody's business, and so the enhancement is passively accepted. If, on the other hand, the ryots had to go to a public office and give their formal and individual assent to an enhancement, it would be found that they would refuse such express and formal assent, and arbitrary enhancements would thus be stopped. The principle of this proposal has been already accepted by the Government of India in legislating for Oudh. It was unanimously approved by the Behar Rent Committee: it is, I think, necessary in order to stop arbitrary enhancements in Behar. The only objections which I can conceive to it are that its adoption might be supposed to tend to prevent justifiable enhancements by mutual and friendly agreement, and that, inasmuch as the ryots are awaking to a knowledge of their rights, it may be supposed they will be able in future to protect themselves from arbitrary enhancements without such restrictions. It is not easy to see how the obligation of registering their agreements can prevent parties from entering into *bona fide* and amicable arrangements in the matter of fixing rents more than it does in agreements on other matters; and as for the supposed awaking of the ryots to a knowledge of their rights, I must say I fear there is not much evidence of the fact in this tract. Having made careful enquiries on the subject, it seems to me that those abuses on the one side and the same lethargy and helplessness on the other, which were commented on some five or six years since, still exist.

8. A third suggestion which I would offer for the restriction of arbitrary enhancements in Behar is that the Collector or Board of Revenue should be empowered to declare that tables of rates should be binding for such period not exceeding 50 years as may to the court appear equitable, instead of having such tables binding for only ten years (section 117 of the Bill). It is obviously inexpedient, and it would probably in many cases be unjust to the present proprietor, to reduce rents now to the figure at which they would stand, if enhancements had been made during the last fifty years, only on the ground and to the extent allowed by the law; but I think it is still more inexpedient, and it would be still more unjust, to perpetuate the present rates where they are excessive. In such cases I would therefore make a moderate reduction at present, and stop further enhancements for thirty years.

9. Statement No. IV attached to this report shows that of a total number of 3,075 ryots in 24 villages, in which enquiries have been made, 2,646 have been in possession for twelve years or more, and 129 are now settlers or non-occupancy ryots. In other words, about 86 per cent are occupancy, and 14 per cent are non-occupancy ryots. These figures are founded on a comparison of the jummalbandis, where they could be procured, and in other cases on the statements of the pulwaris and jeth ryots. The distinction between ryots of twelve years' standing and those of less lengthened possession is not, however, in fact, understood by the ryots at all, either here or in any other part of the country to which my enquiries have extended. There is a general idea prevailing among the ryots that those of them who are of very ancient standing, or whose ancestors brought the village under cultivation, have a right to hold at privileged rates; but as for the mere right to possession, there is no distinction between a ryot of two years and a ryot of twelve years' standing. In the course of my enquiries, among some hundreds of thousands of ryots, I think I might truly say that I have not met ten ryots who understood the "magic of twelve years' possession." Every ryot believes himself entitled to hold possession of his ryot as contradistinguished from the proprietor's *uj pata* or *khannar* as long as he pays at the rates of rent current in his village; or where there are no village rates, as long as he pays at the rate originally agreed upon, together with such enhancements as are imposed from time to time in the village generally. I believe that this is not only the idea prevalent among the ryots, but it is also the idea prevalent among native zamindars also, with the exception of the few who have had an English education, or who have imbibed their ideas in our law courts. In confirmation of this view I may mention that at an interview between Mr. Reynolds and one of the most wealthy zamindars of Gya, at which I was present, the zamindar, while denouncing the proposal to confer occupancy rights generally, was asked, "if he ever ejected a tenant who was willing to pay his rent." His reply was: "Why should I do such an unjust act; I am not a person of that kind."

10. There are very few sub-tenants. These few consist merely of farm-labourers, who are allowed by their employers to cultivate a beegah or so of their employer's land, either on the *battaia* system, or at the rate paid by the principal tenants themselves. The system of sub-letting ryots' land to indigo factories on what are called *kartauli patta*s, is, I am informed by the Sub-Registrar of Dalsingherai, being extended; but the cases of this kind which came under my notice were cases in which there was a dispute between the ryots and zamindar in villages held *khass*, and in villages held under lease they were cases in which it was alleged that the Dalsingherai factory wished to retain possession of *zeat* lands after the expiration of its lease, on the ground that such lands were sublet to it by the ryots.

11. This year's crop of rice, the produce of specimen fields of which was given in my report of the 18th December last, may, as far as I can learn, be taken as an average crop.

12. As I have not been able to have the produce of any *bheet* lands weighed in my presence, I cannot speak with any degree of certainty as to the average outturn of such lands. I have received estimates from pulwaris, jeth ryots, and others, which are scarcely worth reproducing. The most trustworthy estimate which I have received is one from Mr. Crowdy, the manager of the Dowlatpore factory, who has had many years' experience of pergunnah Bhonsaree, and who has generally placed at my disposal all the information and papers he could. His estimate of the outturn and value of the average produce of the various kinds of *bheet* lands, calculated on the staple crops—barley, makhai, murwa, and khodo—is given below:—

	Average produce of -	Rats at which ordinarily sold.		Value	What Mr. Crowdy considers a fair rate for such land	What Mr. Crowdy thinks to be on an average the existing rate.
		Mds.	Mds. bds.	R s p	R s.	
Bheet <i>maaf</i> , known as <i>gaubera</i> , <i>sousabera</i> , <i>mal</i> , &c.	Barley in barley— Bhusai in makhai— Barley Makhai	12 20	1 10 1 20	22 14 11	5 0	From 12 to 18 s.
Bheet <i>drim</i> , known as <i>jashuwar</i> , <i>batgachar</i> , &c., &c.	Barley for pulwar Murwa for bindot	5 10	1 10 1 10	17 0 7	4	" " 4 to " 6.
Bheet <i>sumi</i> , known as <i>usar</i>	Barley in barley— Bhusai in khodo— Barley Khodo	4 10	1 10 1 30	8 14 7	3 8	" " 1-6 to " 4.

13. I have nothing to add to what I have already stated on this subject. In order, however, to illustrate more clearly the difficulties already described, I append a rate-map of village "Tubka Mughribes." The village is sub-divided into blocks according to quality of soil, the boundaries of the lands comprised in each quality being shown by lines of different colour. A glance at the map will show the enormous variety of rates prevailing in each block for lands of the same quality.

I.—Statement showing increase in rates and rentals in villages of the Narhul Estate, pergunnah Sureya, since 1247 F.S. (corresponding to 1840 A.D.)

NAME OF VILLAGE	Government Revenue	Rental in 1247 F.S. (1840 A.D.)	Rental in 1251 F.S. (1892 A.D.)	How many times the rental of 1247 F.S. exceeds the rental of 1251 F.S.	Area under cultivation in 1247 F.S. (1840 A.D.)	Area under cultivation in 1251 F.S. (1892 A.D.)	Percentage of increase in cultivation	Percentage of increase in gross rental since 1247 F.S.	Percentage of increase in average all round rental since 1247 F.S.
	R s	R	R		Bighas	Bighas		R	R
1 Tubka Khata	1,120 0	Not known	470	1,975	11	Not known	47	Not known	186
2 Tubka Mughitree		Not known	944	1,121	11	Not known	48	Not known	76
3 Surawien		Not known	340	1,211	20	Not known	40	Not known	174
4 Mahomedpore Bankura	20 0	Not known	2,800	116 0	Not known	611	Not known	Not known	270
5 Dehimgopora	51 0	Ditto	100	96	Ditto	100	Ditto	Ditto	196
6 Tubka Kuchampore	650 0	Ditto	1,111	1,710	Ditto	100	Ditto	Ditto	171
7 Kuchampore		Ditto	407	274	Ditto	127	Ditto	Ditto	214
8 Kooksa	62 8	Ditto	1,160	19 0	Ditto	217	Ditto	Ditto	241
9 Baghampur, Gungrowli	367 0	Ditto	1,830	5 1	Ditto	600	Ditto	Ditto	100
									Average increase 1%

* The ryots rented the cultivation in civil court in this village.

II.—Statement showing increase in rates and rentals in villages of the other estates in pergunnah Sureya since 1247 F.S. (1840 A.D.)

NAME OF VILLAGE	Government Revenue	Rental in 1247 F.S. (1840 A.D.)	Rental in 1251 F.S. (1892 A.D.)	How many times the rental of 1247 F.S. exceeds the rental of 1251 F.S.	Area under cultivation in 1247 F.S. (1840 A.D.)	Area under cultivation in 1251 F.S. (1892 A.D.)	Percentage of increase in cultivation	Percentage of increase in gross rental since 1247 F.S. (1840 A.D.)
	R s	R	R		Bighas	Bighas		
Damodarpara	987 0	470	1,301	119	113	437	102 decrease	201
Deerpote	Not known	100	100	1	200	102		500
Bachhampore	1,075 0	Not known	11,000	10 5	Not known	7 1/2		
Pekhatampore	105 12	Ditto	0 5	10 5	Ditto	114		
Harpor, Dackhara	Not known	Ditto	92	1 1/2	Ditto	2 1/2		
Jalipore	Ditto	Ditto	1,770		Ditto	1,075		
Hindakepore	Ditto	Ditto	1,121		Ditto	621		
Harjorepore	604 0	Ditto	970		Ditto	201		
Total			20,704			5,754		

The average rate per bigha for 1250 F.S. (1892 A.D.) is Rs 6.

* The village forms part of a mahal which includes other villages also.

III.—Statement showing reduction in present rent-rates which would have to be made in some of the Narhul villages if rates were now fixed by comparison with rates and prices of 1247 F.S. (1840 A.D.)

NAME OF VILLAGE	Name of pergunnah	Average rate per bigha all round in cultivation in 1247 F.S. (1840 A.D.)	Add 50% per cent. increase in price.	Total, being new all round rate.	Existing all round rate per bigha.	Percentage of reduction on existing all round rates and rentals, which would have to be made in order to make them fair and equitable according to the standard of 1247 F.S. (1840 A.D.)
		R s p	R s p	R s p	R s p	
Tubka Khata	Sureya	1 1 3	0 12 0	1 13 0	3 1 0	60
Surawien	Ditto	1 2 0	0 12 0	2 0 0	3 1 0	37
Mahomedpore Bankura	Ditto	1 1 1	0 12 0	1 13 0	3 12 0	60
Dehimgopora	Ditto	1 1 8	0 12 0	1 10 0	3 1 0	60
Kooksa	Ditto	1 0 0	1 3 4	2 11 4	3 6 5	38
Tubka Kuchampore	Ditto	1 0 0	1 0 0	2 11 8	3 0 11	30

* This village was always leased to a native landlord, who, even in the last 20 years, raised the rates by 100 per cent.

17.—*Number of occupancy and non-occupancy ryots.*—The following statement shows the number of occupancy and non-occupancy ryots in villages for which information on this point has been obtained.—

NAME OF VILLAGE	Total number of ryots	Occupancy	Non occupancy	REMARKS
Tungwadi	90	87	3	Founded on statements of patwars and pith notes
Tulka Khas	340	148	1	Founded on statements of patwars and ryots, jumma-bunds having been filed
Tulka Mughubee	115	50	10	Do do do do
Tulka Khatunpore	71	71		Do do do do
Mughubee Bakhara	144	174	10	Founded on comparison of jumma-bunds papers
Kodaka	73	64		Do do do do
Zakunpore	14	48	18	Do do do do
Mughubee	8	51	5	Founded on statements of patwars and ryots
Banham	111	11	6	Do do do do
Harunpore	101	10	10	Founded on comparison of jumma-bunds papers
Dumara	10	10	10	Founded on statements of patwars and ryots
Narunpore	271	264	7	Do do do do
Pansala	71	90	11	Do do do do
Bukheri	37	90	9	Do do do do
Killa Bukheri	21	21	1	Founded on comparison of jumma-bunds papers
Omara	115	10	17	Do do do do
Mughubee Nijari	123	14	17	Do do do do
Muzpore	75	14	17	Founded on statements of patwars and ryots
Phughat	111	220	10	Jumma-bunds
Bukheri Bakhara	42	11	10	Do do do do
Hirunpore	114	11	12	Do do do do
Yakunpore	11	47	4	Do do do do
Abanpore	1	11	8	Do do do do
Total	1,175	2,040	420	

Notes on Tulka Khas village No. 6 of Map II.

Government Revenue.—This mouzah formed part of a Nankar mehal, which was resumed and brought under settlement in 1212 F.S. (1835 A.D.) In the course of the settlement proceedings, the jumma-bunds of the year 1212 to 1217 F.S. (1835 to 1840 A.D.) were filed in the Collector's office. A comparison of these jumma-bunds with the jumma-bunds of the present time makes it possible to come to some conclusion as to the extent to which the rates and gross rentals of this and neighbouring villages have been enhanced during the past 50 years.

This Nankar mehal included an 8-anna share of—

- Villages { (1) Tulka Khas.
(2) Tulka Mughubee.
(3) Sirohlee

The Government revenue fixed in perpetuity in 1217 F.S. (1840 A.D.) is Rs. 607 sicca, the molassal rental of the whole mehal then being Rs. 1,320-15-11. The present molassal rental is Rs. 4,125-6-8, that is to say, six and three-fourth times the Government revenue and three times the average rental of the years 1212 to 1217 F.S. (1835 to 1840 A.D.). The Government revenue in 1212 F.S. (1835 A.D.) was, it is to be remembered, fixed on the basis of half assesses.

Abstract of Jumma-bunds.—The following statement gives an abstract of the present jumma-bunds of the minor's state in mouzah Tulka Khas and of the jumma-bunds of the year 1212 F.S. (1835 A.D.)

ABSTRACT OF JUMMA-BUNDS FOR THE YEAR 1212 F.S. (1835 A.D.)				ABSTRACT OF JUMMA-BUNDS FOR THE YEAR 1217 F.S. (1840 A.D.)				REMARKS
Total area of lands	Detail of cultivated lands	Rate of rent per beghra		Total area of lands	Detail of cultivated lands	Rate of rent per beghra, excluding kachha	Rate of rent per beghra, including kachha	
B k D	No	B k D	R a p	B k D	B k D	R a p	R a p	
44 15 0	1	0 7 10	0 0 0	63 6 4	1 1 2 4	0 4 0	0 2 4 1/2	
	2	0 8 10	0 0 0		2 0 2 17	0 0 0	0 3 0	
	3	0 10 0	1 0 0		3 2 17 1/2	0 11 0	0 12 0	
	4	0 3 0	1 4 0		4 2 0 0	0 0 0	0 4 0	
	5	1 0 10	1 2 0		5 2 0 1/2	0 4 0	0 8 0	
	6	0 17 0	1 0 0		6 0 8 7 1/2	0 0 0	0 2 8	
	7	1 0 0	2 11 0		7 0 1 10	1 12 1/2	4 14 7 1/2	
	8	11 0 17	2 10 0		8 0 8 1/2	0 12 0	0 13 1/2	
	9	0 17 8	2 8 0		9 0 9 4	1 11 0	1 14 1/2	
	10	0 14 0	2 7 0		10 11 10 2 1/2	4 11 0	1 14 4 1/2	
	11	0 14 0	2 6 0		11 8 11 17 1/2	4 0 0	1 11 6	
	12	2 16 0	2 4 0		12 7 6 8	4 0 0	4 11 3	
	13	10 6 11	2 0 0		13 0 4 0	5 0 0	4 11 0	
	14	0 18 0	1 11 0		14 4 17 8	4 8 1/2	1 10 0	
	15	2 8 0	1 12 0		15 3 5 1/2	4 0 0	4 10 3	
	16	12 11 0	1 10 0		16 0 8 1/2	1 2 0	0 8 3	
	17	12 11 10	1 8 0		17 0 11 1 1/2	1 6 0	0 8 3	
	18	0 10 0	1 0 0		18 3 3 1/2	4 8 0	4 7 3	
	19	1 10 17	1 0 0		19 12 8 10 1/2	1 4 0	0 8 1 1/2	
	20	1 0 0	1 4 0		20 0 12 5	0 8 0	0 8 10 1/2	
	21	0 7 10	1 0 0		21 0 0 0	4 3 0	4 5 10	
	22	0 10 0	0 15 0		22 1 10 0	4 0 0	4 3 8	
	23	0 14 0	0 14 0		23 4 7 0	4 0 0	4 2 0	

[illegible]

From these abstracts it will be seen that, while the area under cultivation has increased by only 47 per cent. in this village within the last 50 years, the gross rental has increased by 321 per cent.; further, that while the average rate per begha for the whole area under cultivation was in 1242 F.S. (1835 A.D.) Rs. 1-1-3, the average rate for the area now under cultivation is Rs. 3-1-9, or little less than three times the rate of 1242 F.S. (1835 A.D.) It is true that the highest rate in 1242 F.S. (1835 A.D.) was Rs. 6, while now the highest rate is only Rs. 6-7-4½, but the six-rupee rate in 1242 F.S. (1835 A.D.) was nominal, being 'the ground-rent of a shop. The average rates all round for cultivated land have been nearly trebled in the last 50 years, but not only have the rates all round been thus trebled, but the land for which these trebled rates are now being paid is inferior to that for which the lower rates were paid in 1242 F.S. (1835 A.D.); for 69 beghas 21 kottahs of the best land near the village site have been taken from the ryots and converted into indigo zerat during the past 25 years, while the ryots' cultivation has been extended over the outlying poorer lands.

2. *Past history of the village.*—The jeth ryots say that Mahtab Singh was tikkadar at the time of Ram Narain Singh, who was the present minor's grandfather. He took half an anna karcha on the old rates. He was succeeded by Bechniklal Misser, tikkadar, who incorporated with the rent the half anna taken as karcha by his predecessor, and then realised an anna in the rupee as karcha on his own account. Bechniklal's lease having been renewed, he

similarly again incorporated previous karcha with the rent, and levied an anna per rupee as karcha in addition. On the expiration of Bachuk Mieser's lease, the village was leased to the Dalungserai factory in 1270 F.S. (1803 A.D.) The first lease to the factory was for seven years. This lease was renewed for a further period of seven years, and was again renewed for a term of nine years, which term will not expire before 1292 F.S. (1885 A.D.)

The factory enhanced the rates by one and a half annas in the rupee during the currency of its first lease in 1275 F.S. (1808 A.D.), and again enhanced the rents by half an anna in the rupee last year. This so-called enhancement consisted in simply ordering the patwari to enter the amount as a demand in the village papers against each ryot.

3. *Explanation of increase in number of rates.*—The increase in the amount of the rates is explained in the preceding paragraph. The patwari explains the increase in the number of rates as follows:—As the rates, he says, had become confused in consequence of the numerous enhancements and karchas, the factory manager ordered him in 1285 F.S. (1818 A.D.) to take each ryot's gross rental, inclusive of karchas, and divide it by the number of beeghas of land he held, thus establishing a separate average rate for each ryot. The patwari did so; and the result is that there are 97 separate rates where there were only 29 in 1247 F.S. (1840 A.D.) These 97 rates are, it will be seen, neither village nor customary nor soil-class rates. They are in fact "personal" rates, made out by striking a separate average for each separate ryot's holding.

4. *Facilities for irrigation.*—This mouzah is irrigated from the rivers Mutyes and Kamraen; it is situated within a few miles of the Tuhoot State Railway.

5. *Karchas and absonhs.*—As stated above, half an anna per rupee karcha was imposed last year. The patwari has this year been ordered to incorporate this sum with the rent.

Hisabana intended for pay of the patwari is realized at one pie per rupee.

Special crop rates.—Special rates are not charged for tobacco or other special crops.

7. *Classes of soil.*—The jeth ryots and patwari say there are only two classes of soil and five qualities:—

I.—*Bheet aoul* or gauhera, i.e., manured land near the village sites; *bheet duim*, paelusar, in which there is a large admixture of sand; *bheet sum*, usar up-land (in which there is a mixture of rich).

II.—Dhanhar or matiyar aoul } clayey loam on which rice is grown.
Dhanhar or matiyar duim }

The outturn of two fields of dhan cut by me in this village was respectively 12 maunds and 10½ maunds of dhan per beegha. This is represented to be a twelve-anna crop. Last year the jeth ryot, Abalak Thakur, had what he calls a sixteen-anna crop, which yielded 15 maunds per beegha.

There are no special rates for groves and thatching grass.

No rent is charged for bastoo lands, that is to say, for the sites of ryots' houses.

8. *Occupancy ryots.*—The jumabundhs of 12 years are not forthcoming, from which it might be ascertained how many of the present ryots have held for 12 years. The patwar and jeth ryots say there are no new settlers, that all the ryots are hereditary and resident. There is not land enough for old ryots; why, they ask, should new ryots come?

There are, it is said for the same reason, no sub-tenants in this village. Some few ryots made over a beegha or so for cultivation to their farm labourers at the rates paid by themselves, so as to induce the former to continue in their service; but otherwise land is not sublet by occupancy ryots for profit.

9. *Determination of fair and equitable rates.*—It is generally alleged by the cultivators that the productive power of the land here, as elsewhere, has decreased and is decreasing. Such assertions are, however, founded on vague impressions of what the present generation have heard from their fathers, and in the case of their fathers, from the common tendency to praise the past at the expense of the present. The extension of cultivation to inferior lands has doubtless made the average gross produce per beegha of the whole village area less than it was in former times; but there is nothing to show that the lands which were actually under cultivation in those days produced more than they do now. On the other hand, there have been no improvements in the system of agriculture, nor have there been any increased facilities for irrigation, owing to which it might be concluded that the average productive power of the land has increased. No account need therefore be taken of increase or decrease of the productive power of the land in now determining fair and equitable rates. I shall accordingly only consider what increase or decrease, if any, should be made in the present rates on the ground of increase or decrease in the value of the produce since the rates were last fixed or at any subsequent or former time. Fortunately the materials exist for instituting a comparison of the present rates at present prices in this and neighbouring villages, with the rates and prices of the period 1242 to 1247 F.S. (1835 to 1840 A.D.) These materials are to be found in the settlement records of the taluka which was brought under permanent settlement in 1247 F.S. (1840 A.D.)

In the settlement papers of 1247 F.S. (1840 A.D.) the ameen gives a statement of the prices prevailing in this neighbourhood at that time, which statement was accepted by the Settlement Deputy Collector as correct. The following is a comparative statement of the

increase in prices and increase in rent-rates during the period 1247 to 1289 F.S. (1840 to 1882 A.D.) :—

	Price in 1247 F.S. (1840 A.D.)	Price in 1289 F.S. (1882 A.D.)	Percentage of increase on price since 1247.	Remarks.
	Sacks of 80 R. W. per rupee	Sacks of 80 R. W. per rupee		
Unbroken rice (dhan)	90	87	90	I take the ameen's prices of 1247 F.S. (1840 A.D.) for the purpose of comparison, they being the only prices available, but there is reason to doubt their accuracy. Prices in the neighbouring districts have only risen by 50 to 60 per cent. in the last 40 years, while, according to the ameen's lists, they have risen here by 74 per cent. In my calculations of rates the zamindar gets all the benefit of any increase in prices, as there may be in the ameen's prices.
Indian-corn	80	85	77	
Wheat	70	80	75	
Millet	60	50	60	
Tobacco	Not given	Average (impossible)	73 per cent.	

* Paddy does not sell at the same rate per rupee as the equivalent in rice, as the purchaser suffers from the loss of weight in drying, carriage, storage, &c.

Average rate per bigha in 1247 F.S. (1840 A.D.)	Average rate in 1289 (1882 A.D.), including abwabs.	Increase in rent-rates	Increase in prices.
R. s. p.	R. s. p.		
1 2 3	3 1 0	188 per cent.	73

It thus appears that while the increase in prices for staple crops has been only 73 per cent. in 42 years over the prices of 1247 F.S. (1840 A.D.), the increase in rent-rates has been 188 per cent. over and above the rates of 1247 F.S. (1840 A.D.); and this, be it remembered, though the ameen's prices for 1247 F.S. (1840 A.D.) are accepted as correct. In fact, however, the ameen did, in all probability, understate the prices of 1247 F.S. (1840 A.D.), in order to have the zamindars' jumma fixed at a low figure. As the increase in rates is only justified by increase in prices, and inasmuch as the increase in prices since 1247 F.S. would not be as much as even 73 per cent. if the ameen understated the prices of 1247, it follows that in the proportion that prices ruling in 1247 F.S. (1840 A.D.) were really higher than those given by the ameen, so much the less reason is there for the enhancements which have since taken place. But it is to be further remembered that the ryots pay these enhanced rates for land which is inferior to that which was under cultivation in 1247 F.S. (1840 A.D.), because, as already noted, the best lands have been taken up for indigo, while the ryots' cultivation has been extended to the outlying inferior lands.

Tested, then, by comparison with the rates and prices prevailing in 1247 F.S. (1840 A.D.) it follows that the present rates are excessive. The rent-rates have not only kept pace with, but they have far outstripped the increase in prices during the last 45 years—a state of things which probably exists in no other part of India.

10. In Bengal it is a subject of complaint on the part of zamindars that they have been

Bohar peculiar in that rise in able to obtain little, if any, of that increase in rentals to which rents has outrun rise in prices. increase in prices would legally entitle them.

In the Cawnpore district of the North-Western Provinces, the price of wheat rose by 12·7, of bijra by 34·2, of juar by 43·6, and bajra by 47·7 during the 30 years' period of the last settlement. Yet rent-rates had scarcely risen at all in the North-Western Provinces during the same period—"rent-rates" (*see* Mr. Colvin's settlement memorandum of 1872, paragraph 18, page 741) "not being immediately acted on by prices, but limited by custom and largely controlled by law." (Settlement Report of the Cawnpore district, 1878, page 60, paragraphs 39 and 43.)

In the Azimganj district the Settlement Officer reported in 1881 as follows :—

"The fixity of cultivating tenure which our system of land revenue and record, falling in with the general feeling of the community, has brought about, has prevented any general rise of rent in land upon which a right of occupancy had previously accrued."

In the Muthra district, the price of wheat has risen by 55 per cent., of barley by 65, of gram by 45, and of bijra by 52 per cent. since the mutiny, yet the rise in the competition rents paid by non-occupancy ryots had only risen by 25 to 30 per cent. "since the revision of the records of that district—a period of 25 years." (Settlement Report of the Muthra district, 1879, page 89.)

The Settlement Officer of the Agra district, writing in 1880, says—"The measures adopted at the last settlement with regard to the rents of occupancy tenants have altogether prevented their rising in any proportion to any increase in the value of the land to whatever extent that may have taken place."

The competition rates paid by non-occupancy ryots have risen by 32 per cent. in the Agra district during the last 35 or 40 years, while prices have risen by 50 per cent. in the same period. (Settlement Report of Agra district, 1880, paragraphs 98, 99, and 124.)

Speaking generally of the North-Western Provinces, Mr. Stuck, in his memorandum on current land revenue settlement, 1880, says—"Throughout the greater part of the provinces,

prices have risen by 40 to 50 per cent. during the currency of the last settlement" [in the last 45 years]; "but it has been everywhere found that the rise of rents has not kept pace with rise of prices."

It follows, then, that though prices have risen by 40 to 50 per cent. during the last 45 years in the North-Western Provinces, yet the rent-rates paid by occupancy ryots have scarcely increased at all, and those paid by non-occupancy ryots have only risen by 25 to 30 per cent., while in this village the rates paid by occupancy and non-occupancy ryots alike have been increased all round by 188 per cent., and they have, moreover, far outrun the rise in prices. If, then, the rates for this village were now to be fixed by comparison with the rates of 1247 F.S. (1840 A.D.), taking into consideration the rise in prices since that time, the new average all-round rate would stand as follows:—

	#	α	ρ.
Rate of 1247 F.S. (1840 A.D.)	1	1	3
Add 73* per cent. for increase in prices since that time, such increase not having been effected by the agency of either ryot or landlord (see section 23 of the Bill)	0	12	6
New all-round rate	1	13	9
Present all-round rate	3	1	0

If the rates and prices of 1247 F.S. (1840 A.D.) could be taken as the standard of comparison, the present rates would have to be reduced by 40 per cent. all round in order to arrive at fair and equitable rates.

The rates of 1247 F.S. (1840 A.D.) cannot, however, be taken under the present or proposed law as the basis of comparison, for it is only the prices prevailing when the rates were last fixed, or at any subsequent time that can be taken for comparison in considering the rise of prices. The rates in this village were last fixed in 1275 F.S. (1868 A.D.)

The following is a comparative statement of the then ruling prices with present prices:—

	1868-70.	1890-92.	REMARKS.
	Srs.	Srs.	
Common rice	24	25½	The data on which these figures are based are given in detail on the notes on Dalsingserai annexed.
Indian-corn	35½	47½	
Wheat	21½	29½	

The above figures show that prices now are somewhat lower than when the rates were last fixed in 1275 F.S., yet an enhancement of half an anna per rupee all round was demanded last year by the factory manager, and is now, the patwari says, shown in the jummalbandi.

(11.) To sum up the preceding remarks, it appears that the rent-rates of this village have been enhanced during the 20 years prior to 1868 A.D., out of all proportion to increase of prices, rent-rates having been nearly trebled, while prices increased by only 73 per cent.; *secondly*, that though there has been no increase of prices since 1868, but rather the reverse,

* I wrote to the factory manager, asking on what ground this enhancement is being made. I quote in full his reply (received since this was written). It shows a curious misconception of the grounds on which an enhancement may be made:—

"The enhancement you mention is temporary, and you are misinformed, inasmuch as you have been told that I had given orders that it should be incorporated with the rent. No orders have been passed on the subject in regard to the current season. The enhancement was established by my predecessor for one year to meet loss from a deficiency of *charotee crops*, with the intention of keeping the jummalbandis uniform; and as the ryots were informed of the cause, they voluntarily paid the enhancement, on the understanding that they should receive credit for it in such a year when the blow or was above the average."

That is to say, that because lands A, B, and C yielded less than was expected, the lands of C, D, and E must be assessed so as to make up the difference.

Notes on Tubka Maghribce.

(1) *Government revenue.*—This mouzal forms part of the Nankar mehal, of which the Government revenue is given under Tubka Khas.

(2) *Details of area.*—The details of the present rates and of the areas at each rate are given below. The rates prevailing in 1242 F.S. (1835 A.D.) are not specified in the settlement papers of 1242 to 1247 F.S. (1835 to 1840 A.D.), but they were probably the same as in the

* NOTE.—I have in calculating enhanced rates given the full benefit of increase in prices, according to the rule of proportion, to the zamindar. The meaning of section 3(a) of the Bengal Commissioners' Bill giving the benefit of only half the increment to the zamindar is not clear. If it means only half the *proportion* of increment, then it would introduce a very great change in the enhancement law, and if it means half the *lump* increment, the limitation provided in clause (b) which adheres to the rule of proportion, would render clause (a) inoperative, except where the rent was more than 50 per cent. of the gross produce.

neighbouring village, Pubka Khas, which would give an average rate all round of Rs. 1-1-3. The present average all-round rate is Rs. 1-11-9.—

ABSTRACT OF JUMMA-BUNDI FOR THE YEAR 1250-1251 S.
(1882 A.D.)

Total area			Detail of cultivated lands			Rate of rent per b. bha.			REMARKS
B	A	D	No	B	A	B	A	P	
482	2	124	1	0	1	0	5	15	d
			2	0	1	4	5	0	0
			3	0	5	5	5	0	1
			4	3	14	15	5	14	0
			5	1	12	10	5	11	0
			6	0	7	0	5	11	1
			7	0	4	8	1	11	0
			8	1	1	4	5	2	0
			9	2	0	5	5	2	0
			10	1	2	10	5	8	0
			11	2	4	10	5	6	1
			12	0	8	12	5	3	1
			13	0	1	1	5	0	0
			14	0	0	0	5	10	0
			15	15	0	4	2	9	0
			16	31	12	0	5	8	0
			17	0	1	10	2	7	0
			18	5	12	14	2	2	0
			19	10	7	11	2	5	0
			20	2	5	0	2	4	1
			21	0	10	0	2	1	0
			22	0	7	0	2	1	0
			23	5	0	0	2	5	0
			24	1	4	12	2	1	0
			25	1	10	15	2	1	0
			26	2	0	2	2	0	0
			27	4	10	0	1	11	0
			28	1	12	3	1	11	0
			29	0	2	0	5	12	0
			30	1	0	0	1	11	0
			31	1	0	0	1	10	0
			32	1	5	0	1	10	0
			33	2	0	0	1	10	0
			34	1	16	0	1	0	0
			35	21	5	11	1	8	0
			36	11	16	10	1	5	0
			37	22	1	0	5	4	0
			38	1	0	0	1	1	0
			39	81	14	7	1	0	0
			40	10	16	10	0	8	0
18 aul			01	0	0				
			482	3	124				

Terms of 1250 S.S. (1882 A.D.)
The average rate per begha is

R. a. p.
011 4 11
14 0

(3) *Post history*.—The mouzah was leased to Bekram Lal from 1250 to 1256 P.S. (1813 to 1819 A.D.) The rates prevailing in this period are not known. From 1257 to 1271 P.S. (1850 to 1867 A.D.), it was leased to Mahtab Sing. He raised the rates by 4 annas per begha in 1257 P.S. (1850 A.D.)

From 1275 to 1283 P.S. (1868 to 1876 A.D.), the village was leased to the Dalsingserai factory. This lease was renewed for a further period of 9 years, which will expire in 1292 P.S. (1885 A.D.)

The factory raised the rates by one and a quarter annas in the rupee in 1275 P.S. (1868 A.D.) In 1281 P.S. (1877 A.D.), part of the village was again given in lease to the Dalsingserai factory, and the rest was leased to Targuman Misser and Madim Thakur, who are themselves ryots.

The factory has, during the currency of its last lease, demanded an enhancement of $\frac{1}{2}$ an anna in the rupee, and entered this demand in the jumma-bundi.

(4) *Irrigation and facilities*.—The village is irrigated from the Myter, and is only a few miles from the Tichot State Railway.

(5) *Classes of soil*.—There are two classes of soil and five qualities:—

- I—(1) Bheet aoul, or gauhera.
(2) Bheet duim, or pachasar.
(3) Bheet sunn, or usar.

- II—(1) Dhanhar aoul
(5) Dhanhar duim.

(6) *Number of occupancy and non-occupancy ryots*.—The putwari says there are no new ryots. All are occupancy ryots. There is no distinction in rates paid by occupancy and non-occupancy ryots as such. The jumma-bundi for the past 12 years are not forthcoming. I cannot therefore test the truth of the statement that there are no non-occupancy ryots. The distinction between occupancy and non-occupancy ryots is not in fact at all understood here. Ryots of high caste, whose ancestors have been resident for generations, have sometimes managed to hold at favourable rates, as compared with others; but a ryot once allowed to settle in the village is understood to have a right to hold as long as he pays the rent originally agreed upon, together with such enhancements as may be subsequently made in the village generally.

(7) *Average produce*.—Three specimen fields of *dhan* were cut by me, yielding $7\frac{1}{2}$, 14, and $\frac{1}{2}$ maunds per begha. This year's crop is represented to be an 8-anna crop in the up-lands and 12-anna in the low-lands.

(8) *Determination of fair and equitable rates.*—The present average all-round rate, ascertained by dividing present gross rental by area now under cultivation, is Rs. 1-14-0. The average all-round rate in 1247 F.S. (1843 A.D.) for this and the neighbouring village of Tubka Khas was Rs. 1-1-3, which rate is similarly ascertained by dividing the gross rental by the area then under cultivation. It appears therefore that the rates all round have been enhanced by 80 per cent. since 1247 F.S. (1843 A.D.), while the increase in prices during the same period was 73 per cent. If, then, fair rates were now to be fixed by the standard of comparison with the rates and prices of 1247 F.S. (1843 A.D.), existing rates would have to be reduced. The enhancement of half an anna in the rupee, which the ticcadar demanded last year, would in any case have to be struck off, as not being justified by any increase in average prices since 1275 F.S. (1868 A.D.), when the rates were last fixed.

Notes on Mahomedpore Suukura, Village No. 9 of Map II.

(1) The Nathon minor is proprietor of 8 annas of this mouzah, which forms part of taluk Kishenurampore, and was permanently settled in 1210 F.S. (1803 A.D.) The Government revenue of the Nathon share is Rs. 25, as shown in the settlement papers: the present rental is Rs. 2,589-3-14, or one hundred and fifteen times the Government revenue.

(2) *Abstract of jummalahuti.*—The following statement shows the present rates, and the areas held at each rate. The areas held at the several rates are not given in the old settlement papers, but the rates prevailing in 1248 F.S. (1844 A.D.) are given in the settlement papers of a neighbouring taluka, and are shown below, with the rates and areas of 1275 and 1289 F.S. (1868 and 1882 A.D.):—

ABSTRACT OF JUMMALAHUTI FOR 1275 F.S. (1868 A.D.)				ABSTRACT OF JUMMALAHUTI FOR 1289 F.S. (1882 A.D.)				Remarks		
Number of rate	Rate of rent per bigha	Detail of the cultivated land		Rate of rent per bigha	Total area of the land	Detail of the cultivated land			Rate of rent per bigha	
	R S P	No.	B K D	R S P	B K D	No.	B K D	R S P		
(1)	2 14 0	1	1 0 14	4 0 0	61 0 14	1	0 10 0	5 0 0		
(2)	2 13 0	2	1 11 0	4 12 0		2	10 7 13	4 10 0		
(3)	2 11 0	3	1 7 7	4 8 0		3	35 10 0	4 8 0		
(4)	2 10 0	4	1 5 10	4 4 0		4	11 7 12	4 6 0		
(5)	2 9 0	5	10 11 0	4 0 0		5	10 18 14	4 5 0		
(6)	2 2 0	6	25 9 3	2 8 0		6	19 9 0	4 0 0		
(7)	2 0 0	7	4 17 11	2 7 0		7	7 15 4	3 12 0		
(8)	2 0 0	8	1 0 0	2 4 0		8	7 7 4	3 10 0		
(9)	2 0 0	9	0 8 12	2 3 0		9	4 18 8	3 10 0		
(10)	2 1 0	10	21 1 15	2 0 0		10	1 10 0	1 9 0		
(11)	2 0 0	11	0 5 11	1 0 0		11	27 10 4	3 8 0		
(12)	1 1 0	12	0 0 0	0 8 0		12	0 9 5	3 7 0		
(13)	1 11 0					13	24 8 10	3 6 0		
(14)	1 10 0		47 0 0	0 0 0		14	28 0 17	3 4 0		
(15)	1 12 0		17 13 14			15	4 7 8	3 0 0		
(16)	1 12 0		125 6 84			16	67 12 7	2 14 0		
(17)	1 10 0					17	21 0 3	2 12 0		
(18)	1 0 0					18	1 0 0	2 11 0		
(19)	1 8 0					19	2 10 0	2 10 0		
(20)	1 7 0					20	4 11 9	2 8 0		
(21)	1 6 0					21	0 13 18	2 6 0		
(22)	1 4 0					22	8 10 1	2 4 0		
(23)	1 1 0					23	1 15 4	2 3 0		
(24)	1 0 0					24	0 18 17	2 3 0		
(25)	0 15 0					25	7 1 2	2 0 0		
(26)	0 14 0					26	1 12 0	1 8 0		
(27)	0 12 0					27	10 0 0	0 8 0		
50 0 0						641 8 14		13 15 0		
						2 0 0				
						641 9 14				
The average on area taken from Tubka Khas is Rs. 1 1 3				Jumma including kachha Average on cultivated area				Rs. p. 1,016 12 7 2 7 3		
				Jumma Average on cultivated area				Rs. p. 2,435 15 0 3 12 0		

From this statement it will be seen that, while the highest rate at present is Rs. 5, the highest rate in 1248 F.S. (1844 A.D.) was only Rs. 2-14. Further, that, excluding Tola Jagurnathpore, the gross rental was Rs. 1,648 in 1275 F.S. (1868 A.D.), while with the same area under cultivation in 1289 F.S. (1882 A.D.) it is Rs. 2,435; in other words, the gross rental has been enhanced by 50 per cent. within the past 15 years. The fact that the Government revenue bears such an insignificant ratio to the present rental further shows either that the rental must have been enormously enhanced since the settlement of 1210 F.S. (1803 A.D.), or that there was some irregularity in fixing the Government revenue.

(3) *Past history.*—This village was leased to Dalsingserai factory for three years, 1267 to 1269 F.S. (1860 to 1862 A.D.), at Rs. 850. The jeth ryots say that the rates then were from Rs. 2-8 to 8 annas.

From 1270 F.S. to 1276 F.S. (1863 to 1869 A.D.) it was leased to Behari Raout at a jumma of Rs. 1,151. During this period the ticcadar raised the jeth ryots' rates by 8 annas per bigha in 1275 F.S. (1868 A.D.), and the ryots' rates by 14 annas.

From 1277 to 1285 F.S. (1870 to 1878 A.D.) the lease to Behari Raout was renewed for nine years at a jumma of Rs. 1,600. During the currency of this lease, the ticcadar again raised

the jeth ryots' rate 8 annas, and the ryots' rates 12 annas per beegha. In 1285 F.S. (1878 A.D.) finding he could not realize rent at the above rates, Behari Raout reduced them by 2 annas and 3 pies per beegha. From 1286 to 1292 F.S. (1879 to 1885 A.D.), the village was again leased to Behari Raout at Rs. 1,900. He has this year relinquished the lease, being apparently unable to realize his enhanced rents. His relinquishment has been accepted. The present jumma, inclusive of Tola Jagannathpore, is Rs. 2,859. It thus appears that the reserved rental payable by the ticcadar to the proprietor has been more than doubled in the course of 20 years, further, excluding Tola Jagannathpore, for which the materials for comparison are not available, it appears, as already noted, that the mofussil jumma of the remaining portion of this mouzah was Rs. 1,648 in 1275 F.S. (1868 A.D.), while in 1279 F.S. (1872 A.D.), it was raised to Rs. 2,000, and was reduced in 1285 F.S. (1878 A.D.) to Rs. 2,436; in other words, an increase of 50 per cent. was made in the gross rental in the course of the past 15 years, the cultivated area remaining the same.

(4) *Irrigation and facilities of communication.*—The mouzah is irrigated from the river Jumoonree, and is situated a few miles from the Tirhoot State Railway.

(5) *Kurchas.*—The only kurcha levied is Liyah at half an anna a rupee. It is realized from all ryots other than Bhabuns, who are exempted.

(6) *Occupancy ryots.*—A comparison of the jumma bundia of 1275 F.S. and 1289 F.S. (1868 and 1882 A.D.) shows that, of a total number of 188 ryots, 178 are *kadime* resident occupancy ryots, 10 are *noabad* non-occupancy ryots. The latter settled in the village within the last 10 years.

(7) *Average outturn.*—The patwari says this year's crop was a full sixteen-anna one.

Determination of fair and equitable rates.—The area under cultivation now is exactly the same as it was in 1275 F.S. (1868 A.D.), i.e., 15 years ago. The average rates and gross rentals have been enhanced by 55 per cent. by the native ticcadar Behari Raout in this period, while, as I have shown in my notes on Dalsingserai, there was no increase in average prices in the same interval. In now fixing fair rates, all enhancements made subsequent to 1275 F.S. would have to be ignored as being excessive and arbitrary. Even the rates of 1275 F.S. (1868 A.D.), if compared with those of 1248 F.S. (1841 A.D.), would be found to be excessive.

Soil-class rates.—There are two classes and five qualities of soil, namely:—

- (1) Bheet aoul or gauhera.
Bheet duim or balguchar.
Bheet suim or usur.
- (2) Dhanhar aoul.
Dhanhar duim.

Subject, of course, to the remarks which I made in a former report, as to the difficulty and inexpediency of fixing soil-class rates in this tract, I should, were I called upon to fix soil-class rates for this village, fix them as follows:—

	Maximum.	Average.	Minimum.
	R a.	R a.	R a.
Bheet aoul	5 0	4 4	3 8
Bheet duim	3 8	3 4	3 0
Bheet suim	3 0	2 0	1 0
Dhanhar aoul	3 8	2 12	...
Dhanhar duim	3 0	2 8	2 0

These rates would, I believe, be accepted by the ryots, and taking into consideration the past history of the village, they are certainly anything but low. This is an example of a village held in lease by a native ticcadar, and it shows, as already stated, that though rents in villages leased to the Dalsingserai Indigo Factory have been enhanced out of proportion to any increase in prices, the rents in villages leased to native ticcadars have been enhanced still more. I have ascertained from the settlement papers that the average all-round rate of neighbouring villages was Rs. 1.1-3 in 1247 F.S. (1840 A.D.) If rates were now to be fixed by comparison with the rates and prices of that time, the average all-round rate would stand thus:—

Rate of 1247 F.S. (1840 A.D.)	R a. p.
Add 73 per cent. for increase in prices	1 1 3
	0 12 6
	Total
All-round rate on same land at present	1 13 9
	3 12 6

The present rental and average rates all round would therefore have to be reduced by 50 per cent. in order to make them fair and equitable, as compared with the rates of 1247 F.S. (1840 A.D.)

Notes on Dalsingserai, Village No. 12 of Map II.

The Narhun minor is proprietor of eight annas of this village, the other eight annas being held by Baboo Pirmarayan Singh and others, who are known as the Ramghur Baboos. The two eight-anna shares are held separately, and have separate towji numbers.

(1) *Government revenue.*—The Government revenue of the Narhun eight-anna share is Rs. 51, while the present gross rental, as shown in the jumma bundia of 1289 F.S. (1882 A.D.),

year the factory manager called the ryots together, and asked them to pay half an anna in the rupee by way of commission to the tehsildar who then collected rents. This half-anna in the rupee is shown in the jumma bundi of 1275 F.S. (1868 A.D.) separately from the *assul jumma*, and is entered as "*beshi*."

It is to all intents and purposes an enhancement of rent, though the ryots say it is nothing of the kind. It was, they say, an illegal *abwab*.

There is no evidence to show what rates prevailed before 1274 F.S. (1867 A.D.) The ryots allege that the rates given in the jumma bundi of that year, less by the half-anna *beshi* then added, had come down from the most ancient times. I believe this statement to be untrue. It is made under the impression that the right to hold at fixed rates will be established by false allegations of the existing rates having remained unaltered for a long period. Similar statements were made in regard to Tubka and other villages, and are shown by the settlement papers of 1242 F.S. to 1248 F.S. (1825 to 1841 A.D.) to be quite untrue. It was at first stated by the jeth ryots and patwaris, from similar motives, in regard to these latter villages also that the present rates had come down unchanged from time immemorial; but when the old jumma bundis were produced and examined, it was at once admitted that these statements were false, and the true history of the enhancement was then given.

(5) *Classes of soil*.—The jeth ryots say there are only two classes and four qualities of soil in the village, namely:—

Bheet aoul.—Which includes classes I to VI, as shown in the jumma bundi of 1280 F.S. (1882 A.D.)

Bheet duim.—Which includes the present classes VI to XII.

Bheet suim.—All the rest of the *bheet dhanhar*.

1. *Bheet aoul*.—Includes the late indigo zerats and the manured land near the village site.

Bheet duim.—Is up-land, in which there is a larger mixture of sand called *bhullawaha* or *balguckur*.

Bheet suim.—Up-land, in which there is a mixture of *reh*, locally called *usar*.

2. *Dhanhar*.—Is the clayey loam known as *malayar*.

(6) *Irrigation*.—Dalsingserai is partly irrigated from the Bolan river. The up-lands are not irrigated.

(7) *Facilities for communication and proximity to markets*.—There is a large bazar in the village. The Tirhoot State Railway passes through it.

(8) *Occupancy and non-occupancy ryots*.—There were 38 ryots in this village at the end of 1280 F.S. (1882 A.D.) Of these, 28 are hereditary ryots, whose fathers and forefathers lived in this village. Owing to the system of exchanging indigo for ryoti lands, it is impossible to say whether all or any of these have cultivated the same identical fields for 12 years successively. Seven have been old residents of this mouzah, but they cultivated in the *nizamut* and not the *Narhan potter* till 1285 F.S. (1878 A.D.), when they began to cultivate in the *Narhan share*. There are old residents of the *Narhan potter*, but only took to cultivation of land in 1285 F.S. (1878 A.D.)

(9) *Determination of fair and equitable rates*.—I have not been able to procure lists from the local bazar chowdhry or from the factory manager at Dalsingserai, from which the prices prevailing before 1868 A.D. could be ascertained, though I have no doubt such lists exist. I am therefore obliged to fall back on the price current lists received from the Collectorate, which only go back to 1868 A.D., and give only the prices prevailing at Tajpore, the headquarters of the sub-division. For the purposes, however, of instituting a comparison between the present value of the produce and the value when the rates were last fixed in 1868 A.D., the lists of prices ruling at Tajpore will be sufficient. Prices may ordinarily be a seer or two more or less in Dalsingserai than in Tajpore, but prices now in Dalsingserai probably bear the same proportion to prices in 1868 at Dalsingserai, as prices now in Tajpore do to prices in 1868 A.D. in Tajpore.

The following statements show the average prices prevailing in Tajpore during the three years 1868, 1869, and 1870, as compared with the prices prevailing during the past three years—1880, 1881 and 1882:—

Statement of prices in 1868, 1869, 1870.

	1868.				1869.			
	January. Seers. 28	February. Seers. 25	March. Seers. 25	Average. Seers. 26	January. Seers. 18	February. Seers. 17½	March. Seers. 17	Average. Seers. 17½
Common rice								
	September. Seers. ...	October. Seers. 30	November. Seers. 31	Average. Seers. 30½	September. Seers. 36	October. Seers. 36	November. Seers. 33	Average. Seers. 34½
Indian-corn								
	April. Seers. 25	May. Seers. 25	June. Seers. 26	Average. Seers. 25½	April. Seers. 16	May. Seers. 14½	June. Seers. 15	Average. Seers. 15½
Wheat								
	April. Seers. 25	May. Seers. 25	June. Seers. 26	Average. Seers. 25½	April. Seers. 18	May. Seers. 17½	June. Seers. 16½	Average. Seers. 17½
Paloo								
Barley		Not given.			Not given.			
Millet		Not given.			Not given.			

	1870.			
	January.	February.	March.	Average.
Common rice	22	23	22	22
Indian-corn	September. 41	October. 30	November. 30	Average. 37½
Wheat	April. 18½	May. 18	June. 18	Average. 18½
Barley	Not given.			
Millet	Not given.			

Statement of prices in 1880, 1881 and 1882.

	1880.				1881.			
	January.	February.	March.	Average.	January.	February.	March.	Average.
Common rice	16	15	15	15	25	26	25	25½
Indian-corn	September. 38	October. 37	November. 40	Average. 38½	September. 42½	October. 50	November. 55	Average. 49½
Wheat	April. 16	May. 19	June. 19	Average. 17½	April. 24	May. 24	June. 23	Average. 23½
Pulses	Not given.				Not given.			
Barley	Not given.				Not given.			
Millet	Not given.				Not given.			

	1882.			
	January.	February.	March.	Average.
Common rice	26	25	25	25½
Indian-corn	September. 45	October. 45	November. 45	Average. 45
Wheat	April. 18	May. 18	June. 17	Average. 17
Pulses	Not given.			
Barley	Not given.			
Millet	Not given.			

III.—Comparative statement of average prices for the periods 1868, 1869 and 1870, and 1880, 1881 and 1882.

	1868, 1869 and 1870. 1880, 1881 and 1882.	
Common rice	21½	21½
Indian-corn	35½	44½
Wheat	19½	19½
Pulses, barley, and millet	Information for comparison not available.	

It will be observed that there is an abnormal year in each of these periods: the year 1869 in the first period, when prices were unusually high, owing probably to famine in Central India and scarcity in the North-Western Provinces in that year; the year 1880 in the second period, when prices were abnormally high owing to a local failure of crops.

Leaving these two years out of consideration, the comparative statement would stand thus—

	Average price. 1868 to 1870.	Average price. 1881 to 1882.
Common rice	24 seers.	25½ seers.
Indian-corn	35½ "	47½ "
Wheat	21½ "	20½ "

From these statements it will be seen that, whether the abnormal years are included or excluded from the calculation, average prices now, so far as there has been any change at all, are rather lower than they were fifteen years ago. There is therefore no sort of justification for any enhancement of the rates fixed in 1274 F.S. (1867 A.D.)

The legal, fair, and equitable rates for this village would therefore now be Rs. 6 per beegha for the indigo zerat land lately settled with the ryots, that is to say, the rate actually obtained by competition, and for the rest of the village the rates shown in the jumma bundi of 1874 A.D.

Striking out mere nominal rates which applied to only a few cottahs of land, the legal, fair, and equitable rates will stand thus:—

1. 27 beeghas 6 kottahs 4 dhurs at Rs. 6 (indigo zerat.)
2. 15 beeghas 9 dhurs at Rs. 3-4.
3. 22 beeghas 18 kottahs 18 dhurs at Rs. 2-12.
4. 8 beeghas 2 kottahs 8 dhurs at Rs. 2-8.
5. 41 beeghas 10 kottahs 5½ dhurs at Rs. 2.

If I were to fix rates according to classes of soil for this village, I should fix them thus:—

	Maximum.	Average.	Minimum.
	Rs.	Rs.	Rs.
I.—Bheel soil	8	6	4
Bheel daim	4	3-4	2-8
Bheel kaim	2-8	2	1-4
II.—Phanbar	3	2-8	2

The only reasons I can assign for fixing these rates are—

- (1) that they would probably leave the gross rental at the sum shown on other grounds to be fair and equitable in the legal sense;
- (2) that they would be accepted by the ryot

I do not, however, say that these rates are fair and equitable according to principles of justice and equity, for I think that the rates of 1274 F.S. (1867 A.D.), on which the above rates are founded, are at least three to four times the rates which prevailed in 1210 F.S. (1803 A.D.), when the permanent settlement of this village was made; and I do not think prices have risen to anything like three or four times the prices prevailing in 1210 F.S. (1803 A.D.) If the prices prevailing in 1210 F.S. (1803 A.D.) could be ascertained and compared with the present prices, and rents were now fixed by that standard, they would have to be very much reduced. Since writing the above, I have received and examined the settlement records of 1247 F.S. of neighbouring villages. They show that a reduction of 40 per cent. in existing rates would have to be made in order to make the present rates fair and equitable according to the standard of rates and prices of 1217 F.S. (1810 A.D.)

Notes on Kunksa, Village No. 13 of Map II.

This village is entirely the property of the Narhun minor. It is situated about two miles south-east of Dalsingserai, and contains 258 beeghas of 3,600 square yards.

(1) *Government revenue and present rental.*—The Government revenue, which was fixed in 1803, is R 62-8, and the present rental, exclusive of karchas, is R 927-15-1, and including karchar, R 1,158-10-3½, or nearly nineteen times the Government revenue.

ABSTRACT OF JUMMAHUNDI.

The following statement shows the details of the present jummahund and of the jummahund of 1274 F.S. (1864 A.D.), i.e., the year before the present rates were fixed.

ABSTRACT OF JUMMAHUNDI FOR 1274 F.S. (1864 A.D.)					ABSTRACT OF JUMMAHUNDI FOR 1282 F.S. (1875 A.D.)				
Area of cultivated lands.	Total of cultivated lands.	Rate of rent per beegha, exclusive of karchas.	Rate of rent per beegha, inclusive of karchas.		Area of cultivated lands.	Total of cultivated lands.	Rate of rent per beegha, exclusive of karchas.	Rate of rent per beegha, inclusive of karchas.	
B. K. D.	No.	B. K. D.	Rs. A. P.	Rs. A. P.	B. K. D.	No.	B. K. D.	Rs. A. P.	Rs. A. P.
216 14 2					217 2 0				
	1	84 0 12	3 9 0	1 2 3		1	84 11 17	4 4 0	8 5 6
	2	4 0 6	3 8 0	4 1 3		2	4 0 6	4 7 0	8 4 0
	3	12 6 4	3 7 0	3 0 0		3	27 15 16	4 0 0	8 2 1
	4	13 8 1	3 6 0	3 13 0		4	17 0 18	4 3 7½	8 0 0
	5	0 14 12	3 4 0	3 12 0		5	0 14 7	4 2 1½	1 13 0
	6	18 3 6	3 3 0	3 11 0		6	16 14 6	4 1 0	1 12 0
	7	40 12 11	2 16 0	3 7 0		7	41 14 17	3 12 0	6 7 3
	8	6 10 6	2 13 0	3 4 3		8	2 0 14	3 12 0	6 0 0
		0 4 0				9	0 0 13	3 10 0	6 3 0
							0 4 0		
Total		216 14 7			Total		217 2 0		
				Average rate per beegha, R 4-1-0					Average rate per beegha, R 5-3-3, including shwabs and norms not shown above.

(2) *Past history.*—This village was given by the Narhun Baboos to one Sridist Narain of Chainpore, by way of gift during his lifetime. When he died without heirs, the village was resumed and leased in 1265 F.S. (1858 A.D.) to Behari Baout. Behari Baout immediately proceeded to enhance the rates by two annas in the rupee. His lease expired in 1274 F.S. (1867 A.D.) It was renewed in 1275 F.S. (1868 A.D.), when he again raised the rates by four annas in the rupee.

It thus appears that from 1265 to 1275 F.S. (1858 to 1868 A.D.), or within a period of eleven years, the rents of this village have been enhanced by 87½ per cent.—an enhance-

ment which is out of all proportion to the increase in value during that period of produce or productive powers of the land. The ryots did not resist the enhancements by appealing to the civil courts. There is no evidence to show what were the rates prevailing before 1265 F.S. (1858 A.D.)

(3) *Karchas and sairats*.—The following are the karchas realized in this village :—

I.—*Gaumia*.—Half an anna in the rupee, intended to pay salary of patwari, village amla.

II.—*Butta*.—One anna per rupee, being for difference between Company's and country rupee.

III.—*Kiyali*.—Realized from *beparis* or traders who come from outside to purchase grain in the village. It is levied at the rate of $1\frac{1}{2}$ pies in the rupee. The *beparis* for this cess take $2\frac{1}{2}$ seers per maund from the ryots. This cess was abolished in Durbhunga under the orders of the Court of Wards—see Board's No. 611A, dated the 1st September 1876, to the Commissioner of Patna, and their other orders on abolition of cesses in the Durbhunga raj.

IV.—*Katiari*.—This is a cess of from 10 annas to 4 annas, realized from *brameaks*, *jullahas* (weavers), *dunnahs* (cotton spinners), and *mallaks* (fishermen). It is realized from persons of these castes solely because they are of these particular castes, and whether they follow their several professions or are merely cultivators. This cess was abolished in the Durbhunga raj under the orders referred to above, which might with advantage, I think, be applied to this estate also.

V.—*Kotwali*.—On tobacco, at Rs 1-4 per beegha, over and above the rent. Only realized on tobacco actually grown. I have found this cess only in this and one other village.

Classes of soil.—The jeth ryots say there are only five real distinctions of soil :—

I.—*Bheet aoul*, *gaubera*, i. e., manured upland near the village sites.

Bheet dum, *balguchat*, i. e., bheet, some distance from the village, not manured.

Bheet suim—*usur*.

II.—*Dhanhar* or *matiyar*.

Dhanhar { aoul.
 { dum.

(5) *Occupancy and non-occupancy ryots*.—A comparison of the *jumma* bundis for 12 years shows the total number of ryots in this village at the end of 1289 F.S. (1882 A.D.) was 54, all of whom are old resident ryots.

(6) *Determination of fair and equitable rates*.—The rates were last fixed in 1275 F.S. (1868 A.D.) The law presumes the rates then fixed to be fair. I have shown in my notes on village *Dalsingserai* that there is no legal ground for altering the rates then fixed. The present rates would therefore be fair and equitable in the legal acceptation of those terms. Some of the karchas and *abwabs* are illegal, and should be struck off. If I were asked to fix rates according to quality of soil, I should, having regard to the present rates and to the arbitrary enhancements of the past, fix them as follows :—

	Maximum.	Average.	Minimum.
	Rs. A.	Rs. A.	Rs. A.
I.—1. Bheet aoul	5 0	4 8	4 0
2. Bheet dum	4 0	3 8	3 0
3. Bheet suim	3 0	2 8	2 0
II.—4. Dhanhar aoul	4 0	3 8	3 0
5. Dhanhar dum	3 0	2 8	2 0

These rates would still be considerably higher than those which prevailed before the last enhancement. If the fair rates were now to be fixed by comparison with the rates prevailing in neighbouring *mouzas* in 1247 F.S. (1840 A.D.), they would stand thus :—

	Rs. A. P.
Average rate of 1247 F.S. (1840 A.D.) (in neighbouring <i>mouzas</i>) Tubka Kishenpore	1 9 0
Add 73 per cent. for rise in prices	1 2 8
New all-round rate	2 11 8
Present all-round rate	5 5 8

The present rates would therefore have to be reduced all round by 49 per cent. in order to make them fair and equitable, as compared with rates and prices of 1247 F.S. (1840 A.D.)

Notes on Tillage Tubka Kishenpore.

This *mouza* forms part of taluka Kishore Narianpore Nair, which was permanently settled in 1210 F.S. (1803 A.D.) The Government revenue is Rs. 550-0-6.

(1.) The following statement gives details of area and present rates, and of the rates prevailing in 1247 F.S. (1840 A.D.) taken from the settlement papers:—

ABSTRACT OF JUMMALUNDIS FOR 1247 F.S. (1840 A.D.)				ABSTRACT OF JUMMALUNDIS FOR 1289 F.S. (1882 A.D.)				REMARKS.
Total area of lands.	Detail of cultivated lands.		Rate of rent per beegha.	Total area of lands.	Detail of cultivated lands.		Rate of rent per beegha.	
B. K. D.	No.	B. K. D.	Rs. A. P.	B. K. D.	No.	B. K. D.	Rs. A. P.	
49 13 10	1	18 15 29	2 0 0	330 4 7½	1	76 0 0	4 0 0	
	2	1 15 0	1 12 0		2	7 11 8	3 7 0	
	3	11 0 0	1 10 0		3	0 4 12	3 2 0	
	4	11 0 0	1 8 0		4	1 7 2½	3 0 0	
	5	1 5 0	1 2 0		5	7 7 12	2 14 3	
	6	3 2 10	1 0 0		6	1 6 1	2 11 0	
	7	0 12 10	0 12 0		7	17 13 18	2 10 0	
	8	0 10 0	0 5 0		8	17 16 4	2 12 0	
Summa, Rs. 79-1-10 of part of the village taken as a specimen of the whole by the ameer in 1247 F.S. (1840 A.D.)					9	0 11 0	2 11 0	
					10	20 13 11½	2 10 0	
					11	7 6 10	2 10 2	
					12	1 5 12	2 9 0	
					13	3 0 12	2 8 2	
					14	0 10 0	2 8 0	
					15	4 10 15	2 7 0	
					16	0 10 0	2 6 0	
					17	3 6 8	2 6 0	
					18	4 8 7	2 6 0	
					19	4 11 15	2 6 0	
					20	5 8 18	2 5 0	
					21	1 16 13	2 2 0	
					22	0 10 17	2 1 0	
					23	36 13 4	2 0 0	
					24	2 4 8	1 14 6	
					25	2 9 0	1 11 0	
					26	4 8 2	1 17 0	
					27	1 8 0	1 11 0	
					28	0 16 0	1 12 0	
					29	1 12 9	1 10 8	
					30	4 12 17	1 10 0	
					31	6 5 6	1 8 0	
					32	3 7 3	1 7 0	
					33	12 10 3	1 7 8	
					34	11 5 10	1 5 7	
					35	4 0 0	1 4 5	
					36	16 16 7	1 4 0	
					37	2 10 10	1 1 0	
					38	1 10 0	1 2 0	
					39	7 1 1	1 1 0	
					40	2 12 10	0 11 0	
					41	9 12 7	0 8 0	
					42	1 10 0	0 8 6	
					43	1 10 0	0 8 0	

(2.) *Post history.*—Bikram Lal was ticcadar from 1250 to 1256 F.S. (1843 to 1849 A.D.) He enhanced the rates, but the ryots say they do not remember by how much.

From 1257 to 1274 F.S. (1850 to 1867 A.D.), Mahab Singh was ticcadar. He raised the rates by one anna in the rupee during his first lease, and again by one anna in the rupee during his second lease.

From 1275 to 1284 F.S. (1868 to 1877 A.D.) the village was leased to the Dalsingserai factory, which raised the rates by one and a half annas in the rupee in 1876 F.S. (1869 A.D.)

From 1285 to 1292 F.S. (1878 to 1885 A.D.), the lease to the factory was renewed. During this period the rates have been enhanced in the year 1289 F.S. (1882 A.D.) by half an anna in the rupee; and the same process of striking average "personal" rates was gone through, as has been described in other villages leased to the factory.

(3.) *Irrigation and facilities for irrigation.*—The mouzah is irrigated from the river Mytee and is within a few miles of the Tirhoot State Railway.

(4.) *Occupancy and non-occupancy ryots.*—The manager of the Dalsingserai factory, to which this village is in farm, says he cannot produce the jummalundis of the past twelve years, as they are filed in court. It is therefore impossible to ascertain the number of occupancy as compared with non-occupancy ryots. The jeth ryots say there are no non-occupancy ryots. There are 71 ryots and one or two sub-tenants. The sub-tenants are merely servants of the higher caste cultivating ryots, to whom the latter have let a beegha or so of land each, as an inducement for them to remain in the village and work as farm labourers. Lands thus sublet are said to be sublet at the rates paid by the subletting tenants themselves.

(5.) *Determination of fair rates.*—The present average all-round rate is Rs. 3-5-11. The average all-round rate in 1247 F.S. (1840 A.D.) was Rs. 1-0. There has therefore been an increase in rates of more than 110 per cent. during the past 42 years, while the increase in prices during the same period is only 73 per cent.

If rates were now fixed by the standard of comparison with rates and prices of 1247 F.S. (1840 A.D.), the new all round rate would stand thus:—

	Rs. A. P.
Rates of 1247 F.S. (1840 A.D.)	1 0 0
Add 73 per cent.	1 2 3
New rate	2 11 3
Present average all-round rate	3 5 11

A reduction of 19 per cent. all-round would therefore have to be made in the present rates, in order to arrive at rates which would be fair and equitable, as compared with the year 1247 F.S. (1840 A.D.)

As, however, the rates were last fixed in 1276 F.S. (1869 A.D.), the rates of that year would be the fair and equitable rate in the lease of the present law and Bill. There, in the sense of the present law and Bill, is no justification for the demand of an enhancement of half anna per rupee made last year.

Notes on Rayhopore.

THIS mouzah is part of talooka Kishore Narainpore.

(1). The annexed statement gives an abstract of the present jummaundi and of part of the jummaundi of 1242 F.S. (1835 A.D.), which was taken as a standard of comparison in fixing the rates of neighbouring villages under the then settlement:—

ABSTRACT OF JUMMAUNDI FOR 1242 F.S. (1835 A.D.)				REMARKS.
Total area of lands.	Detail of cultivated lands.		Rate of rent per beegha.	
B. K. D.	No.	B. K. D.	Rs. A. P.	
52 8 7	1	10 15 7	2 8 0	This abstract was only for part of the village, which was taken by the ameen as a specimen of the whole. 1247 F.S. 1835 (A.D.) B. K. D. Rs. A. P. 52 8 7 99 11 0 The average rate per beegha is Rs. 1-14.
	2	1 0 0	2 6 0	
	3	12 0 10	4 0 0	
	4	16 0 0	2 0 0	
	5	1 15 0	1 4 0	
	6	6 17 10	1 0 0	
	7	4 0 0	0 11 0	
		52 8 7		
Jumma ... Rs. 99-11				

ABSTRACT OF JUMMAUNDI FOR 1289 F.S. (1882 A.D.)					REMARKS.
Total area of lands.	Detail of cultivated lands.		Rate of rent per beegha, excluding karchas.	Rate of rent per beegha, including karchas.	
B. K. D.	No.	B. M. D.	Rs. A. P.	Rs. A. P.	
12 11 17	1	0 9 7	3 12 0	3 13 10	1289 F.S., 1882 (A. D.). B. K. D. Rs. A. P. 127 11 17 397 7 6, including karchas. The average rate per beegha is Rs. 2-4-8.
	2	0 16 2	3 9 0	3 10 9	
	3	4 4 10	3 8 0	3 9 9	
	4	3 10 7	3 5 6	3 7 0	
	5	0 17 12	3 2 0	3 3 6	
	6	7 13 7	3 0 9	3 2 3	
	7	10 17 14	3 0 0	3 1 6	
	8	5 0 16	2 14 8	3 0 3	
	9	0 17 10	2 12 0	2 13 4	
	10	5 14 2	2 11 6	2 19 0	
	11	3 16 18	2 11 0	2 12 4	
	12	5 14 4	2 10 9	2 12 0	
	13	25 8 9	2 10 11	2 11 6	
	14	1 16 7	2 8 0	2 9 3	
	15	3 8 19	2 5 8	2 6 9	
	16	0 17 4	2 4 0	2 5 1	
	17	1 0 0	2 2 6	2 3 6	
	18	0 17 4	2 2 0	2 3 0	
	19	27 5 8	2 0 0	2 1 0	
	20	9 16 6	1 14 0	1 15 0	
	21	10 4 7	1 13 3	1 14 1	
	22	0 18 0	1 13 0	1 14 0	
	23	2 17 10	1 12 0	1 12 10	
	24	0 13 3	1 11 0	1 11 9	
	25	1 0 14	1 10 9	1 11 0	
	26	1 2 1	1 10 0	1 10 9	
	27	6 6 5	1 8 9	1 9 8	
	28	6 14 11	1 7 6	1 8 3	
	29	1 2 8	1 6 0	1 6 8	
	30	2 7 11	1 2 0	1 2 6	
	31	12 0 0	1 1 0	1 1 6	
	32	3 6 0	1 0 0	1 0 6	
	33	2 0 0	0 8 6	0 9 9	
		179 11 17			
Jumma ... Rs. 397-7-6					

(2). *Past history.*—The village was leased to Mahtab Sing from 1257 to 1247 F.S. (1850 A.D.). He raised the former rates by one anna in the rupee.

From 1275 to 1284 F.S. (1868 to 1877 A.D.) the mouzah was leased to the Dalsingha Factory, which demanded an enhancement of one and a half annas per rupee in that period.

The jeth ryot says the ryots refused to pay this enhanced rate. The factory manager sued Chutter Chowdhry for rent at the enhanced rate which he was demanding. The suit was dismissed, and rent was decreed only at the former rate admitted, namely, Rs. 2-10, Rs. 2, Rs. 1, and Rs. 0-10-0.

The village was again leased for nine years to the factory, from 1284 to 1293 F.S. (1877 to 1886 A.D.) During this period the factory has demanded an enhancement of half an anna in the rupee.

(3). *Determination of fair rates.*—In this village the enhancement of rates is not excessive with reference to increase of prices; but there is no justification for the demand of half an anna in the rupee made in 1289 F.S. (1882 A.D.) It will be observed that the ryots of this village resisted enhancements in the civil courts, hence it is that the present rates are low compared with the rates of 1247 F.S. (1840 A.D.) I would not, however, interfere with present rates, for they are low compared with those of 1247 F.S.

Notes on Gongowlee.

The total rent-paying area, exclusive of some 35 beeghas held under mokurraee lease by the Dowlatpore Factory is Rs. 568-17-14, the total mofussil rental, exclusive of karchas, being Rs. 1,377, and, inclusive of karchas and abwabs, Rs. 1,621. The Government revenue is Rs. 357.

(1.) The following statement gives an abstract of the jumma bundis of 1289 F.S. (1882 A.D.), and shows the rates prevailing in 1248 F.S. (1841 A.D.), as ascertained from the settlement papers:—

ABSTRACT OF JUMMA BUNDIS FOR 1289 F. S. (1882 A. D.)					FOR 1248 F. S. (1841 A. D.)					REMARKS.
Total area of the cultivated lands.		Detail of cultivated lands.		Rate of rent per beegha, including karchas.	Detail of cultivated lands.		Rate of rent per beegha.			
B. K. D.	No.	B. K. D.	Rs. A. P.	Detail	Rs. A. P.	No.	B. K. D.	Rs. A. P.		
405 8 10	1	0 15 0	3 4 0	Buttamal	85 11 0	1		3 8 0	Average rate of 1248 F (1841 A. D.), Rs. 1-14-0	
126 0 0	2	0 12 1	3 2 0	Durbulla	6 2 12	2		3 6 0		
541 8 10	3	0 11 10	3 14 0	Mchilamse	8 4 3	3		2 8 0		
	4	0 12 25	2 13 0	Torkafout	12 11 0	4		2 4 8		
	5	135 10 04	2 11 6	Singu.	2 11 12	5		2 5 0		
	6	10 13 17	2 0 3			6		2 2 0		
	7	72 14 04	2 0 0	TOTAL	101 9 8	7		2 1 3		
	8	0 0 3	2 0 6			8		3 0 0		
	9	0 0 4	2 0 0	Haut	71 8 0	9		1 12 6		
	10	0 10 16	2 6 4	Bale	0 12 9	10		1 0 0		
	11	0 17 14	2 0 0	Jokur	43 0 4	11		1 4 0		
	12	13 17 14	3 4 6	Tar	2 12 6	12		0 8 0		
	13	0 10 1	2 4 0	Mutaria	0 12 6					
	14	04 10 164	3 0 0	Khupia at						
	15	0 5 0	1 12 0	Rs. 1-4 per						
	16	1 8 104	1 0 0	beegha	30 2 3					
	17	1 8 0	1 2 6							
	18	2 0 2	1 4 0	TOTAL	140 4 0					
	19	1 0 0	1 3 2							
	20	2 15 17	1 0 0							
	21	18 12 114	0 0 0							
Zarat		126 0 0	216 11 3							
TOTAL		567 9 10	46 10 8							
Including karchas, &c.			1,630 0 0							
Average rate per beegha of 1289 F. S.			0 9 8							

(2). *Past history.*—This village was leased to Bhagwanpore Factory for 29 years, from 1234 to 1261 F.S. (1827 to 1854 A.D.) The rates were not altered during this period.

From 1262 to 1270 F.S. (1855 to 1863 A.D.) it was leased to Ram Sing, ticcadar. He raised the rates by three and a half annas per beegha.

From 1271 to 1284 F.S. (1864 to 1877 A.D.) it was leased to the Dowlatpore Factory. The rates were not changed in this period.

From 1285 F.S. (1878 A.D.) it was leased to Behari Raout, who sold his interest to the manager of the Dowlatpore Factory. The Collector, on the part of the Court of Wards, objected to the sale, on the ground that a ticcadar is not empowered to transfer his interest by sale. The ryots alleged that Behari Raout had settled the zarat lands with them before selling his interest to the factory, and they also were opposed to the sale. Friction consequently arose between them and the factory. The factory was, however, declared by the civil courts entitled to possession of the zarat lands.

(3). *Occupancy and non-occupancy ryots.*—There are 90 ryots in the village, of whom the patwarree and jeth ryots say that only three are non-occupancy ryots. The others are all old resident ryots, but their lands are changed under the system of indigo cultivation from time to time.

(4.) *Sub-ryots*.—About ten beeghas have been sublet to six sub-ryots, who are mere farm-labourers. The land is sublet at the rates paid by the ryots themselves.

(5.) *Karchas and abwabs*.—A list of the karchas and abwabs is given in the abstract of jumma-bundi above. The following are peculiar:—

Khapra.—A cess levied at Rs. 1-4 per beegha on tobacco actually grown.

Terakapant.—Said to have been originally levied for expenses of constructing a bund.

The bund has long since been destroyed, but the abwab is retained.

Sadiat.—Marriage expenses, but retained, though there are no marriage expenses.

(6.) *Determination of fair and equitable rates*.—There has been comparatively little increase in the rates of this village during the last forty years—a circumstance which is due partly to the fact that it was so long under lease to the Bhagwanpore Factory and partly to the fact that the jeth ryots, who are Bhabuns, resisted enhancements in court.

■ PINUCANE.

Endorsement by Officialing Under Secretary to Government, Bengal,—No. 454 L.R., dated 3rd March 1883.

Copy, with copies of the enclosures and the plans in original, submitted to the Government of India in the Department of Revenue and Agriculture, for information, in continuation of my endorsement No. 363 L.R. of this date.

The return of the original plans is requested.

C. S. BAYLEY.

No 122A, dated Calcutta, the 19th February 1883.

From—H. J. S. COTTON, Esq., Secretary to the Board of Revenue, L. P.,

To—THE SECRETARY TO THE GOVERNMENT OF BENGAL, Revenue Department.

I am directed to submit the accompanying copy of a report No. 114, dated 6th February 1883 (and maps), from Baboo Parbati Churn Roy, on the result of his enquiries for the preparation of tables of rent rates.

HON'BLE H. L. DAMPIER, C.L.E.

2. In the first instance the tract assigned to this officer was defined as the Nizamut lands, and he commenced his enquiries on villages belonging to the Nizamut estate in the Gopinathpore pergunnah in the district of Moorshedabad. As, however, it was ascertained that the Nizamut lands are scattered over several districts, the tract over which his enquiries were to be made was more accurately defined. He was directed to limit his enquiries to an area of about 25 square miles, which should comprise lands belonging to private zemindars as well as Nizamut lands.

The substantive results of his investigation as bearing upon the present object is as follows:—

3. With rare exceptions and those applying only to very small areas, or to small fractional shares in joint estates, the landlords have no jumma-bundis showing rates, by which the existing rents are determined. They have only annual jumma-wasil-baki papers which show the demands, collections, and balances in respect of each ryot.

No classification of land is recognized in the existing rent arrangements. The only possible means of finding the average incidence of the present rents on the area under enquiry would be by a measurement of the land included in each holding, and then striking the average incidence on each beegah of the total amount of rent payable for the holding.

4. In paragraph 16 of his report No. 36,* dated 8th January 1883, Baboo Parbati Churn Roy describes his attempt to carry out this operation in the village of Kandi Gopinathpore. The result as applied to the holdings of ten ryots of that village is as below:—

* Submitted to Government with Board's No. 79A, dated 1st February 1883.

Name of Ryot	Area of holding			Total Rent of holding			Rent per beegah		
	Rs.	K.	D.	Rs.	A.	P.	Rs.	A.	P.
A	18	12½	0	37	1	0	2	0	0
B	1	15½	0	11	8	0	2	14	0
C	16	18	0	14	0	0	2	9	0
D	18	7	0	42	14	0	2	5	0
E	38	11	0	65	7	0	1	11	0
F	15	5	0	34	12	0	2	4	6
G	14	4	0	26	3	0	1	13	6
H	6	18	0	36	11	0	5	3	0
I	1	11½	0	2	12	0	1	11	11
J	4	10	0	10	8	0	2	5	4
TOTAL OF HOLDINGS			...	...			24 12 10		

The general result is an average incidence of rent at the rate of Rs. 2-8 on each beegah, but the average incidence per beegah struck on the rent of each holding, taken separately, varies from a maximum of Rs. 5-3 to a minimum of Re. 1-11. If the holding which averages Rs. 5-3 be thrown out of the calculation as exceptional, the general average would be Rs. 2-2-10 per beegah; but even this would press with undue severity on the two holdings which now pay at the average rate of Re. 1-11 only. Rejecting these two again from the calculation, the average incidence on the remaining seven holdings would be about Re. 2-5. This as a general rate would do no great violence to the remaining seven holdings, but it is clear that a rate which can only be derived by excluding three holdings out of ten from the calculation of the average cannot be taken to be a working "general rate" for the purpose of a table of rates.

It is beyond the scope of the present enquiry to make the extensive measurements which would be necessary to ascertain the average incidence of rent on lands in the other villages.

5. There is no reason to doubt that Gopinathpore is a typical village, and the conclusion may be accepted that in the absence of jumamahundis and similar information, there is no possibility of educing from existing rents such an average rate as can properly be adopted as a fair general rate.

Similarly, without such measurements, which would make it possible to institute a comparison between area and rents, it is impossible to say whether existing rents are fair or not; but in his last report Baboo Parbati Churn Roy expresses the belief that owing to these rents being founded on assessments made so long ago, they now sit very unequally on the ryots. The lands of some of the ryots which have improved by fluvial action are now under-assessed, while the majority of the ryots cannot pay their nominal rents in consequence of the reduction in the profits of the land owing to the decline of the silk industry.

6. The general information contained in paragraphs 8, 9, and 10 of Baboo Parbati Churn Roy's present report regarding the decline of that industry, the depression which it has produced on the general condition of the ryots of this part of the country without directly affecting the zemindars' rents, and the effect it has had on the adjustment of rents, points to the necessity of providing by legislation for facilities for claiming reductions of rent in consequence of altered circumstances of the ryots.

7. In order to frame the scale of rates which would be fair and equitable for any particular tract, the ascertainment of the general existing rates is the first essential; but the attempt to ascertain these rates in the present case has failed and left no foundation on which the fabric of a fair and equitable table of rates can be constructed. Old canoongoe papers are forthcoming, from which the rate prevailing some 50 years ago can be ascertained. A laborious enquiry might bring out a comparison of doubtful trustworthiness between average prices of produce at the time when the rates of the canoongoe papers prevailed and those which now exist; but before this could be of any value for the purposes of framing a "table of rates" under the provisions of the Rent Bill, it would be necessary to determine whether the prevailing rates of rent at which the ryots pay are at higher rates than those shown in the canoongoe papers. If this is not the case, except in the very improbable alternative of the zemindars being able to prove variation of the rate of rent since the permanent settlement and before the preparation of the canoongoe papers, the 20 years' presumption would bar enhancement, and the table of rates could recognize nothing higher than the general rate of existing rents.

Clause 12 of Instructions.

8. If the prevailing rents were shown to be at higher rates than those of the canoongoe papers, the presumption of right to hold at fixed rents would not arise; but before the enhanced rates obtained by raising the canoongoe rates in the same proportion as prices of produce have risen, could be adopted as fair and equitable rates for a table on the principles of the Rent Bill and the Instructions which were approved by Government, it would be necessary to make sure that they did not transgress the limitation imposed, *viz.*, that they have not the effect of more than doubling the existing general rate. The datum required for the imposition of this limit also is wanting.

9. With a view to prepare an estimate of the average produce and its money value, Baboo

III. "The preparation of an estimate of the gross produce of the land and of the average prices at which it is locally sold by the ryots to pay their rents." Section III of clause 3 of the Instructions.

Parbati Churn Roy first ascertained by experiment the actual outturn of produce per beegah of a certain number of fields in a village, and then applied the average as the average outturn per beegah of these fields. Accepting this result as the average yield for the present year and the vague statements of the ryots (no other information being available) which he found to be approximately correct for the past four years, he calculated the average annual outturn for five years. The average price of a maund of rice was ascertained from the account books of certain grain dealers of Kandi Gopinathpore bazar, where the ryots of the three villages of Kandi Gopinathpore, Raiabati, and Thira sell their rice. In calculating the average money value of the gross produce per beegah, Baboo Parbati Churn Roy has adopted the proportion of rice to paddy as given at page 290 of the first volume of the Statistical Reporter, and this proportion has been found to be very nearly the same as that obtained by him from experiments subsequently made, the result of which was reported to Government in my No. 79A, dated 1st February 1883.

10. The following results were obtained by this method of calculation :—

<i>Gopinathpore.</i>	
" Estimated average outturn per beegah	{ 5 maunds 17 seers of paddy, yielding 3 maunds 34 seers of rice.
<i>Rajahati.</i>	
" Estimated average outturn per beegah	{ 3 maunds 29 seers of paddy, yielding 2 maunds 26 seers of rice.
<i>Thira.</i>	
" Estimated average outturn per beegah	{ 5 maunds 10 seers of paddy, yielding 3 maunds 29 seers of rice.
" The average price of a maund of rice being Rs. 1-8-11, the money value of the average gross produce in the three villages will be as follows :—	

<i>Gopinathpore.</i>		Rs. A P.
" Rice, 3 maunds, 34 seers, at Rs. 1-8-11 per maund		5 15 11
" Straw		1 8 0
Total money value		7 7 11
<i>Rajahati.</i>		
" Rice, 2 maunds, 26 seers, at Rs. 1-8-11 per maund		4 2 0
" Straw		1 0 0
Total money value		5 2 0
<i>Thira.</i>		
" Rice, 3 maunds, 29 seers, at Rs. 1-8-11 per maund		5 12 8
" Straw		1 8 0
Total money value		7 4 8 "

11. Mr. Dampier cannot, however, think that any averages founded on such limited enquiries as these would form a safe basis for general conclusions. Further experiments cannot be made at present, as no rice crop is on the ground. And further enquiries for the purpose of drawing conclusions seem to be unnecessary as the result is required for the object of framing tables of rates, which object, it has been shown, cannot be attained for other reasons. Baboo Parikati Churn Roy's special enquiries may therefore be considered at an end, and the Board have directed him to return to his general duties.

No. 114, dated Camp Kandi *via* Berhampore, the 6th February 1883.

From:—**BABOO PARIKATI CHURN ROY**, on Special Duty,

To:—The Secretary to the Board of Revenue, Lower Provinces.

I have the honor to submit the following report of the progress of operations conducted by me during the fortnight ending with Saturday, the 3rd February 1883.

2. Agreeably to the orders contained in your letter No. 109A, dated the 29th January 1883, I have confined my enquiries to the tract of 25 square miles marked out round Kandi Gopinathpore in the one inch map submitted with my letter No. 96, dated the 24th ultimo.

The villages contained within this tract are shewn in the accompanying trace prepared on the scale of $\frac{1}{4}$ mile.

3. In my letter No. 109, dated the 2nd instant, I have brought to the notice of the Board that the circumstances of the other estates comprised within the selected area were similar to those of Gopinathpore, and that there was no evidence to prove that the rents of those estates had varied since the permanent settlement. Of the 74 villages included within the selected tract, 13 belong to pergunnah Gopinathpore. The proprietors of 54 out of the remaining 61 villages, on being called upon to produce the jummaabandi and other papers whence the present and former rates of the lands in their possession could be ascertained, have filed petitions to the effect that they had no jummaabandi or other rate papers, and that all that they possessed were jumma-wasil-bakis. These jumma-wasil-bakis are similar to those filed by the Nawab of Moorsheedabad, a copy from a page of which was submitted by way of a specimen for the inspection of the Board with my letter No. 36, dated the 8th January 1883. These jumma-wasils are quite useless for the purposes of the present enquiry, as they do not shew rates of rents nor areas of holdings. It does not also appear from the jumma-wasil-bakis that the rents have ever varied since the permanent settlement. For seven villages jummaabandis have been filed on behalf of the proprietors, but it will appear from the account given below regarding each of these seven villages that the jummaabandis do not shew any variation in rents, and that they are therefore quite as useless as the jumma-wasil-bakis.

Thurgaon-Kantba.—The jummaabandi paper that has been filed by one of the proprietors of this village is dated 1245. It shews that in 1245 the rates for lastu were Rs. 5 and Rs. 8 a beegah, and that the other rates varied from Rs. 2-8 to 8 annas. It is said that there has been no variation in the rates since 1245, but as there is no evidence that there existed other

rates at any time previous to 1216, the jummalundi of this village is no more useful than the jumma-wasil-baki papers of the villages which have no jummalundis.

Gopinathpore Ar.—The *patnidar* of this village has filed jummalundis prepared by him in 1285 after he had taken *patni*. These papers do not shew the rates actually paid by the ryots, but what the *patnidar* after measurement considered were fair and equitable rates, for it appears from memoranda recorded in the body of the jummalundis that the amounts actually paid by the ryots were much less than what were assessed according to the rates entered in the jummalundis. These papers are therefore no guide as regards existing rates, and there is no evidence to shew what rates prevailed before.

Jadab Singlatce.—This village belongs to pergunnah Gopinathpore and to pergunnah Phawa. There are many petty proprietors in the latter pergunnah, two of whom filed jummalundis. The papers of one of the proprietors named Kristo Lall Ghose are dated 1269, 1273, and 1277 B.S. They shew slight variation in rents, which amount every year to about Rs. 30. The average rate shewn by the jummalundis of 1269 and 1273 is Re. 1-5, while that shewn by the jummalundi of 1277 is Re. 1-8-6. The proprietor states that the actual realizations are greater. The other proprietors' papers are dated 1193, 1198, and 1252 B.S. He too is a small shareholder, the total annual rental of his share being about Rs. 25, and though his rates are a little higher than those of the first named proprietor and shew slight variations, the area covered by his jummalundis is too small. His rates cannot, therefore, be used for purposes of comparison as regards the lands of adjoining mehals.

Amoon Ar.—The proprietor of this mahal has filed a jummalundi paper dated 1241. In his petition he states that he has no other paper regarding the mahal than the one filed by him. Amoon Ar is a very small village, as will appear from the map.

Jashoharee.—This village belongs partly to pergunnah Gopinathpore and partly to another pergunnah, Mulundi. One small shareholder of the latter pergunnah has filed the jummalundis of his share for 1269, 1273, and 1277. These papers shew some slight variations in rents. The average rates for the above three years are 10 annas, 10½ annas, and 11 annas respectively. But the proprietor, Kristo Lall Ghose, who is the same person who has filed the jummalundis for *Jadab Singlatce* noticed above, says that the actual realizations are greater than the rents entered in the *arhal jummalundis* filed by him. The average rate per beegah for pergunnah Gopinathpore in this village has been ascertained from rents and areas to be Re. 1.

Batoor.—The proprietors of this village have filed a jummalundi dated 1261 B.S. They state in their petition that they have no other jummalundis whereby it could be ascertained whether there have been any variations in the rents either before or after 1211.

Ghand Singlatce.—The same Kristo Lall Ghose, whose jummalundis of *Jadab Singlatce* and *Jashoharee* have been referred to above, has also filed jummalundis for this village for 1269, 1273, and 1277. These papers shew that in 1269 and 1273 the rents were Rs. 62 for 62 beegahs, but that in 1277 they were 88 for 66½ beegahs, more lands having been brought under cultivation this year. The average rent per beegah is therefore Re. 1, but, as in the case of *Jadab Singlatce* and *Jashoharee*, the actual realizations are said to be 1½ times the rents entered in the jummalundis for those that are not actual cultivators, 1¼ times for *mondals*, and 2 times for actual cultivators. The rates for *bastu*, *adbastu*, *mudberry*, and *sali*, as entered in the jummalundis, are Rs. 5, Rs. 2-8, Re. 2, and Re. 1-8 respectively. These agree with the rates for the same classes of lands given in the *canoongoe* papers for this village, with the exception of the rate for *mulberry*, which is entered in the *canoongoe* papers at Rs. 2-8 instead of Rs. 2 entered in the jummalundi. It therefore seems that, at least in this village, the *canoongoe* rates are the rates still prevailing, or are the rates recognized by the landlord and tenant.

Bed Dahshwar.—The proprietor of this village has filed no jummalundis or other papers whereby the rates of rents could be ascertained. He has filed some *kabuliyats* taken from ryots in 1238. The *kabuliyats* give the total area and the rent of each holding, from which the average rate per beegah seems to be about Re. 1-4. These *kabuliyats* are, no doubt, evidence as regards the ryot who executed them, and they may be of value when the question of enhancement in the case of those particular ryots has to be decided; but they can have no possible value in the decision of the general question of the determination of rent-rates applicable to a comparatively large tract of country. Moreover, the circumstances of this village, which, as its name imports, once formed the bed of a *beel*, are altogether different from those of an ordinary village, and the rates current in this village must not be taken into consideration while preparing rent-rates for village differently circumstanced.

Bawon Dastatce.—The proprietor of this village has filed jummalundis for 1219, 1222, and 1223 B.S. These jummalundis shew no variation in rates. All these papers are upwards of 65 years old, and as none have been filed shewing the rates at present prevailing, it is not possible to say whether there have been any variations in the rents or not since these jummalundis were prepared.

4. From what I have learnt from the zemindars and others, as well as from the circumstances described in the preceding paragraph, it appears that as a rule the *canoongoe* rates remain unchanged. There exist in the Collectorate *canoongoe* rate papers for all the villages excepting only a few. These rates have been obtained from the Collector of the district, and have been shewn under each village in the trace submitted herewith. There has not been, as far as I have been able to ascertain from enquiry, any enhancement of rates

Canoongoe rates appear to remain unchanged; but actual realization seems to be greater on the whole.

above the canoongoe ones. But if the statement of Kisto Lall Ghose, noticed above, in connection with the jummahundis of *Jadab Singhpore*, *Jashahar*, and *Chital Singhpore*, is correct, and the practice of taking $1\frac{1}{2}$, $1\frac{2}{3}$, and 2 times of the *ashai* rents based on the canoongoe rates is general, then the condition of the ryots of the tract under enquiry cannot be very satisfactory. I applied to the Collector of Moorshedabad for information regarding the circumstances under which the canoongoe rates were prepared. But as yet I have not been favoured with a reply. I have, how ever, been informed by a clerk whom I sent with the letter to the Collector that the circumstances could not yet be fixed.

5. But whatever the circumstances may have been under which the canoongoe rate papers were prepared the fact that there does not exist even for a single village in a tract of country containing 74 villages any *chitta* or *jumamahundi* papers cannot but be disadvantageous to both the landlord and the tenant. Baboo Nuriendro Narayan Roy, zemindar of Bannachura of pergunnah Futtchasing in reply to my letter to him asking for jumamahundis, writes as follows:—

"With reference to your letter No. 61 of the 19th instant, I have the honour to submit the papers as per accompanying list. Only two jumamahundis of the two mauzas *Chital*, *Nihra Danga* and *Bannur* have been found in the shereeta. As for the other papers of the several mauzas, as are written on the the list, I am able to supply you with only jumamahundi-bikris. They will do to serve you if you can kindly undertake to measure the lands included therein and compare them with the jumamis of each of them. I hope you will be able to ascertain something of the rates of rent now in vogue."

Now it will be seen from the above that what the zemindar means by "rate" of rents in vogue is not the average rent per bigha determined from total area and rental. He evidently refers to some rates such as the canoongoe rates, though he does not expressly say so. For to test he should be a loser by accepting them. Neither does he state what the rates in vogue are according to his knowledge or belief, but leaves them to be determined after measurement and enquiry. This shows the state of confusion at present prevailing.

6. But the evils of the present state of things under which the extent of a ryot's holding, not to speak of the different classes of lands comprised in the holding cannot be determined from any papers in the zemindar's shereeta must be more serious than they at first sight appear to be. So long as things get on smoothly there can be no harm to the zemindar or the ryot, but no sooner a difference arises between the two than the position of both becomes difficult. For instance, when a zemindar sells the *jote* of a ryot in execution of a decree or in pursuance of the purchase, whether the landlord himself or some other person, knows only the *muamala* of the *jote*, and has to find out the different plots comprised in the holding from enquiry, founded by any documentary evidence, and it not unfrequently happens that when a ryot holds more than one *jote*, which he often does, the purchaser of one of the *potas* seizes more lands than he is entitled to, or the ryot tries to retain a portion of his *jote* along with his other *potas*. Similar difficulties arise in cases of enhancement or rejection. In this manner litigation goes on, and he who succeeds in securing the largest number of witnesses on his side wins in the end. The man who is supposed to be acquainted with the different plots of land belonging to the holding of each ryot in a village is called the *hathree*, and it is on him more than on anything else that the zemindar as well as the ryots have to depend. As regards the ryot, the non-existence of any record of the lands comprised in each holding is productive of further difficulties and troubles when the division of a holding takes place, either through transfer or inheritance.

7. It may at first be imagined that notwithstanding all the evils attending the non-existence of jumamahundis, the position of the ryot must on the whole be good, as under the law the zemindar is prevented from making further enhancement in rents from want of evidence proving variation since the permanent settlement. But from a careful study of the condition of the ryots, I cannot but think that the present rents do not, at least in the case of the ryots of some of the villages, prove very hard. This part of the country is subject to annual inundations through the actions of the rivers More and Dwarka, both of which are hill-streams. The floods of the More in former times used to cause so much damage to crops that the zemindars of pergunnah Futtchasing, most of whose villages are situated on the banks of this river, were allowed at the time of the permanent settlement abatement in the revenue in order to enable them to raise embankments for the protection of the low lands. But since that settlement, and even during the last 40 or 50 years, vast changes have taken place in the character of the country. High lands which were once valued on account of their comparative security from floods, have grown too high and risen above the ordinary flood level, while low lands, which formerly suffered from inundations, have gained by gradual alluvial deposits and in many cases risen high enough, so as not to suffer from the effects of destructive floods. In consequence of these changes rich lands have grown poor, and poor lands have grown rich. Moreover, as in more recent times, 30 or 40 years ago, there has been a diversion in the course of the More by which the main channel has taken a more southerly course, the deterioration in the productive powers of the high lands in the tract under enquiry may be said to be of a permanent nature.

8. But the principal circumstance which enabled the ryots of the upland villages to

Decline in silk industry.

bear the high rates of rents in former times was the very prosperous condition of the silk industry. This industry has greatly declined of late, and though ryots still continue to grow mulberry and rear silk-worms, they do not find it to be a profitable business. "The silk industry, once so flourishing," says a writer on 'The Silk Industry in Moorsshedabad' in the Statistical Reporter for 1876, "has however, been for years in a declining state, and its decline has been so much accelerated within the last two or three years (which makes it ten years from 1853) by causes which have affected the whole of the Bengal silk trade, that its extinction at no very distant date may well be apprehended. * * * To those who are dependent on the industry for their livelihood, * * * its decline and probable extinction mean impoverishment and ruin." * * * "Many individual owners of filatures, principally natives, are compelled to close their filatures; rearsers of silkworms, exposed to the numerous accidents of rearing, are abandoning their occupation, or carrying it on without profit; and growers of mulberry are rapidly withdrawing their lands from the cultivation of that plant, leaving it in the hands of rearsers who are bound to provide food for their worms. The effects on the other classes interested are obvious. Many spinners are thrown out of employ; weavers must content themselves with the bare means of subsistence instead of the affluence of former days; and zamindars must relinquish the high rental of the abandoned mulberry lands, or receive no rental at all on such lands for some years, as they cannot generally be used at once for the cultivation of other crops."

All that is said above regarding the effect that depression has produced on the condition of all concerned in silk industry applies to the people of this part of the country, with the exception that while all others have suffered, the zamindars have not. There being no chittas and jummaabundis, but only jumma-wasil-bakis, the ryots must pay the high rents for the mulberry and rice lands, or let go the whole jumma and be turned out of their paternal holdings.

9. As may be readily imagined from the above, the general condition of the ryots of

General condition of the ryots in the tract under enquiry.

this part of the country, especially of those villages in which the mulberry was in former years grown extensively, is not at all good. In the course of my enquiry, I have come to know that in two out of the three villages, the rice of which was experimented upon, the ryots were largely in arrears. In Kandi Gopinathpore and Raiabati the zamindar has obtained many rent decrees against the ryots, some of whose holdings have also been sold. But as there were none to bid for them, the holdings have reverted to the zamindar, who has not yet found ryots to whom he could again let them out. Seeing the course of such sales the zamindar has very prudently taken from some of the judgment-debtors bonds for the amounts of the rent decrees, and as regards the others he has kept the decrees pending unexecuted waiting for better seasons. But though after a good rice harvest the zamindar may succeed in realizing his rents, the permanent decline of the silk industry will prevent there being any material improvement in the condition of the ryots.

In paragraph 16 of my report No. 36, dated the 8th ultimo, has been given the average rents per beegah as Rs. 2-8 for one of the villages, Kandi Gopinathpore. The averages for the other two villages experimented upon are Rs. 1-13 6 for Raiabati and Rs. 1-9 6 for Thira. The average values of the gross produce for the above three villages being Rs. 7-7-11 for Gopinathpore, Rs. 5-2 for Raiabati, and Rs. 7-4-8 for Thira (vide paragraph 19 of report No. 36, dated the 8th January 1883), the ratio of rent to gross produce is found as follows:—

	Rs.	A.	P.
Gopinathpore—			
Average rate	2	8	0
Average money value of average gross produce	7	7	11
Ratio of rent to gross produce, one-third			
Raiabati—			
Average rate	1	13	6
Average money value of average gross produce	5	2	0
Ratio of rent to gross produce, nearly three-eighths			
Thira—			
Average rate	1	9	6
Average money value of average gross produce	7	4	8
Ratio of rent to gross produce, nearly one-fifth			

It will appear from the above that the ryots of Raiabati suffer most from the pressure of high rents, and that this is the fact is proved by more holdings having been sold for rent decrees in this village than in any other. As might be expected, the ryots of Thira are comparatively better off. They are also in better accounts with the zamindar.

But it is not only the ryots of Gopinathpore and Raiabati that suffer from rack-renting; the ryots of most of the villages in the neighbourhood would seem also to suffer from the same cause. During the past two years, for which figures have been obtained from the Kandi sub-divisional office, while there were 256 and 226 notices of relinquishment, there were only six and one notices respectively of enhancement. The tract of country round Kandi Gopinathpore brought under the present enquiry is one of the most westerly parts of the Moorsshedabad district. Speaking of the difference between the east and the west, the Collector, in

his administration report for 1872-73, extracted as page 265 of Mr. MacDonnell's Famine Report, says:—

"I have before remarked on the difference between the east and the west as regards surface, soil, crops, and inhabitants. I would here add that I believe the generality of the inhabitants of the east are in better circumstances than those of the west. The cause is not difficult to find. Singularly situated as the soil of the west—generally clay with small nodules of limestone—is for the cultivation of paddy, its cultivators are exposed to this disadvantage, that should there be a failure of their crops from absence of reasonable rain, or any other cause, they cannot expect to make up for their losses to any appreciable extent by means of some other crop. The *aman* rice is in fact their mainstay; though of course good crops of mulberry and sugarcane also add to their prosperity. In the east of the district, on the other hand, the cultivators do not depend on a single crop. If there be a failure of the *aman* rice, they can still hope much from their cold-weather crops; and it seldom happens that there are failures of crops at both seasons of the year."

As a natural consequence of the above, this part of the country has suffered more or less during famines. Though the intensity of the famine of 1873-74 was not very severe, that of 1865-66 was decidedly so.

It will be seen from the extract from the Collector's administration report quoted above that "the *aman* rice is in fact the mainstay of the people, though, of course, good crops of mulberry and sugarcane also add to their prosperity." I have in a foregoing paragraph described the present declining state of the mulberry crop. As regards the sugarcane, its cultivation here is of a very unimportant nature, and I have been told by the sub-divisional officer of Kandi that no sugar or *gur* is manufactured here for exportation, the *goor man* i-factured being consumed locally. This is also what I have come to learn after enquiry. It appears from the analysis of the chitta of the typical village, Gopinathpore, that the area of sugarcane fields in this village is only 16 beegahs, while that of mulberry is 206 beegahs. The sugarcane cultivation has therefore no perceptible effect on the condition of the ryots of the selected tract.

10. That mulberry played an important part in the adjustment of the present rents ■

Mulberry played an important part in the adjustment of present rents. evident from the fact that in Kandi Gopinathpore, which may be accepted as a typical upland village, 206 beegahs out of a total area of 2,000 beegahs has been entered under mulberry at the late measurements. Besides the above, 80 beegahs, now measured as *danga rubbi khanda*, seem to have been in former times also cultivated with mulberry, for the canoongoe papers shew no rate for *danga rubbi khanda* in this village. These lands seem lately to have been cultivated with rubbi crops in consequence of the decline of the silk industry. Now the canoongoe paper shows that the rates for mulberry were Rs. 8, Rs. 7, Rs. 6, and Rs. 5 per beegah, which gives an average rate of Rs. 6.5 a beegah. The rental on 206 beegahs of mulberry at Rs. 6.5 beegah, would therefore be Rs. 1,357. The total rental of the village according to the jumma-wasil-bukis filed by the zemindar is Rs. 3,128, so that the rents for mulberry form three-fifths of the entire rental of the village. Even if the 80 beegahs now measured as *danga rubbee* were excluded from the mulberry area, the rental of the remaining 206 beegahs would exceed Rs. 1,200. Such being the case, the present depressed state of the silk industry must affect the condition of the ryot very materially, and measures should be taken to grant him some relief in consequence of decrease in the value of mulberry.

11. The question ultimately becomes, how can a revision in the rents be made on the

The rule of proportion based on increase or decrease in productive powers, or value of produce, requires modification, and the benefit of 20 years' presumption allowed to ryots requires to be withdrawn. ground of increase or decrease in productive powers or value of produce when there are no means of comparing the present state of things with any preceding state, and when, again, the 20 years' presumption gives the ryot a right to hold on the present rents as fair and equitable? But, if the rent question is to be at all approached with a view to a satisfactory

solution, the present law, which lays down an unworkable rule of proportion, based on increase or decrease in productive powers or value of produce, should be modified, and the benefit of the 20 years' presumption now allowed to the ryot should also be withdrawn. The present settlement, and not the permanent settlement, of which no information is available, should be made the basis of future adjustments. It is true that this settlement will be of a somewhat arbitrary character; but if it is judiciously conducted after thorough enquiries and measurements, there is no reason to fear that it will prove disadvantageous to either the landlord or the tenant. It will appear from paragraph 7 of this report that while in some upland villages the zemindar may be a loser by the proposed adjustment, in the low land villages he will be a gainer, and on the whole there will not be any material decrease in rents, but the only effect will be to distribute the burden more fairly and equitably among the ryots of the different villages belonging to an estate.

12. From all that has been stated above, it will be evident that the only true solution

The preparation of ryotwaree jummaabundis after cadastral surveys is the only possible solution of the rent question for the tract under enquiry. of the rent question for this part of the country is the preparation of ryotwaree jummaabundis after cadastral surveys. But how, it may be asked, is this ryotwaree jummaabundi to be prepared, seeing that there is no means of determining the rates of rents on which the present rentals were fixed? I admit that from want of former measurement papers there will be some difficulty in first making the

classification, and then adjusting rents to classes. But the few jammabundis noticed in paragraph 3 of this report will be so many guide books. More such jammabundis will be forthcoming if the tract to be operated upon be larger than the present one. The village patwaris and mondals will be of service in comparing these jammabundis on the spot. The broad principle that underlies the system of classification followed in these places is the highness or lowness of a field, and the facility it enjoys for purposes of irrigation. Those rice lands which first receive the rain-water drained from the village or which are irrigated by natural flow from a tank on an outlet being made, are always classed high, lands irrigated from water artificially raised are classed lower, while those lands which are not within reach of any irrigating tank or other reservoir of water, and have to depend entirely on the rains, are classed lowest. Though rice is the main staple produce of this part of the country, still as a large proportion of the rents is derived from mulberry, the mulberry lands ought also to be separately classed. When the lands of a village have been measured and classified, the rents at present paid should be distributed among the different classes according to their productive powers. In this manner the present rates for different classes of land will be obtained. The next question will be to determine whether these rates deserve to be enhanced or reduced. In the determination of what should be fair and equitable rates for mulberry, the accounts and other papers of silk manufacturers and of English silk factories will be useful. But no hard-and-fast rules of proportion will answer. Keeping the maximum in view, the rents will be increased or decreased according as circumstances may require; but no violent changes will be made on any account.

13. It has been said on behalf of zemindars that the proposal to fix the maximum at one-fourth the gross value of produce is not fair to them, but that they are entitled to a larger share. It at first sight looks that a much larger share of profit is reserved for the ryot when only a fourth part of the gross produce is declared as the zemindar's share. My recent experience of the costs of rice cutting and husking, not to speak of the other costs of cultivation, leads me to believe that there is no reason to fear that a very large share of net profit will fall to the lot of the ryot under the present proposal. The expenses of cultivation are much greater than what are ordinarily supposed to be, and it is the net profit from which, in my opinion, the zemindar's share should be determined.

14. Another circumstance brought to light in the course of the present enquiry also deserves mention in this report. It is often alleged on behalf of the zemindar that the proposal to make occupancy rights transferable is an innovation. But without going to discuss what the custom in other places is, I beg to state that the custom of buying and selling *jotes* is here very general, and that the zemindars themselves also put such *jotes* for sale at execution of rent decrees. Baboo Hepin Behary Mookerjee, Moonsiff of Kandi, to whose kind assistance I am greatly indebted for several things in connection with the present enquiry, tells me that it is seldom that the zemindars object in court to the transfer of *jotes* by ryots. I have in paragraph 6 of this report spoken of ryots having more than one *jote* in their possession. The jumma-wasil papers of Gopinathpore shew that this custom of buying and selling *jotes* has been very general in the pergunnah. But though custom is thus in favour of the ryot, a legal enactment declaring its validity will, no doubt, be productive of very great advantage, as it will prevent the litigation that occasionally crops up at present. The fear that is generally entertained, that the effect of making the right of occupancy transferable will be that all such *jotes* would gradually pass into the hands of the money-lenders, is, so far at least as this part of the country is concerned, quite unfounded. On the other hand, I find as a fact that all old *jotes* which have changed hands are still in the possession of cultivating ryots.

15. In order to enable the Board to form an idea of how the different descriptions of lands are situated in the villages of the selected tract, I have made a trace from the map of the typical village of Gopinathpore, prepared under the Nizamut Deputy Collector, which I beg to submit herewith. It will appear from this map that there are numerous tanks in the village. This seems from maps received from the Surveyor-General's office, which are also herewith submitted, to be the peculiarity of the villages of this part of the country. The tanks are mostly used for the purpose of irrigating the mulberry fields. They seem to belong to the ryots, though from the long lapse of time since they were excavated it is not possible to say to whom they belong. The area covered by tanks in this village is 194 beegabs, which is about one-tenth of the total area.

It will appear from the map that while the different descriptions of lands around the village sites are intermixed and are not well adapted for measurement in blocks according to character of soil, there are considerable blocks of rice fields of the same class, which could conveniently be measured according to the system proposed by me for the classification of land. But on the whole I am inclined to believe that my scheme is better adapted to the Eastern Bengal districts than to this part of the country.

Orders regarding further employment solicited.

16. In conclusion I beg to request that, as I have no more enquires to make, orders regarding my further employment may be issued without delay.

Endorsement by Officiating Under-Secretary to Government, Bengal,—(No. 752 L.R., dated 3rd March, 1883).

COPY, with copies of the enclosures, submitted to the Government of India, in the Department of Revenue and Agriculture, for information, with reference to my endorsement No. 752 L.R., dated the 11th December, 1882.

C. S. BAYLEY.

No. 70A., dated 1st February, 1883.

From—Secretary to Board of Revenue, Lower Provinces,
To—Secretary to Government, Bengal.

In reply to your demi-official letter of 30th January 1883, intimating that the Lieutenant-Governor is desirous of being informed of the progress made by the Rate officers in Moorshedabad, Hooghly and Jesspur, and in continuation of the Board's letter No. 23A., dated 26th January 1883, I am directed to submit herewith copies of the reports noted in the margin, showing the progress made by Babu Parbati Churn Roy and Messrs. Tobin and Macpherson in the tracts assigned to them.

2. The reports from Hooghly are still of a desultory character, but it is probable that the report for the present fortnight may furnish a fuller summary of what has been done by Mr. Carstairs.

H. J. S. COTTON.

No. 36, dated Camp Kandi with Berhampore, the 8th January 1883.

From—BABU PARBATI CHURN ROY, on Special Duty,
To—The Secretary to the Board of Revenue, Lower Provinces.

I HAVE the honor to submit the following progress report of the work done by me during the fortnight ending with Saturday, the 30th December 1882.

2. *Pergunnah Gopinathpore does not form one compact block*—It will appear from the one-inch maps (sheets Nos. 8 and 10 of Moorshedabad, and No. 5 of Beerbhoom), submitted herewith, that the lands of pergunnah Gopinathpore do not form one compact block, but are scattered over different parts of the district. I have been able to make experiments only in blocks Nos. I and II in sheet No. 10. The Board are aware that when I commenced the experiments, I had no maps to guide me in the selection of the area; but I now find that the tract of country in which I have conducted experiments forms the most important and the largest compact part of pergunnah Gopinathpore. In this area experiments have been made in two villages, namely, Kandi Gopinathpore including Raiabati and Thira (in the map written Kheera). The former represents the condition of a village close to the river with ordinarily high and low lands, and the latter that of one somewhat remote from the river, in which the low lands are of a beely character. Detailed accounts of the experiment made in these villages will be found in paragraphs 6 and 7 of this report. An experiment was also made on the rice of a field in a fourth village called Dengapara; but as I could not remain present at this experiment from its beginning to end, and as there was no time for making further experiments in this village (the rice having since been all cut), I have omitted to take this experiment into account.

3. *No jummaabundis exist of Pergunnah Gopinathpore*.—In my last report, as well as in previous letters, I informed the Board that I had not received any jummaabundis, and I have to state the same thing also in the present report. It will appear from the accompanying copy of a letter No. 152, dated the 12th December 1882, from the Nabab of Moorshedabad, that he has "not got the jummaabundi papers of pergunnah Gopinathpore, as no jummaabundi has ever been made of that mahal by the Nizamut." On my further application the Nabab has sent the jumma-waseel-baki or collection papers. A specimen copy of a page of one of these papers is submitted herewith for the inspection of the Board. It will be seen from this specimen that the jumma-waseel shows only the rent payable by each ryot, without any specification of the quantity of land held by him.

4. *No information available regarding rates or classification*.—Under paragraph II of the instructions, the first process for the rate officer is declared to be "to obtain the jummaabundis of each village or estate for the purpose of ascertaining rent rates payable by occupancy and non-occupancy ryots for each separate class of soil now recognized in each village or estate comprised in the selected area." The principal reason why the estates of private zemindars were not selected for the purpose of the present enquiry, was stated to be that "there would be delay in the production of jummaabundis, and further delay in testing their accuracy." The advantage of selecting the Nizamut lands appeared to the Board to be "that though the necessary information as to existing rents could readily be procured, the lands had been under ordinary zemindary management." Now, whatever might be the case as regards the other Nizamut lands, no information regarding existing rents which could help the present enquiry is, as has been stated above, available in pergunnah Gopinathpore, which is mentioned

in the "memorandum on the preparation of a Table of Rates," as especially fitted for the present enquiry as the most compact portion of the Nizam lands.

5. *Proposal to make experiments in several villages simultaneously abandoned.*—I need hardly state that the want of jummabundis has surrounded the enquiry with difficulties from its commencement. "Having procured the existing jummabundis, the rate officer is to proceed to classify the lands. He is then to take the best land in the tract under enquiry, and ascertain its actual gross produce." He is to go through the same process regarding the lands of other classes. The rate officer is in fact to be guided in his selection of the classes and qualities of lands to be experimented upon by the jummabundis. But not having the jummabundis, I was not able, previous to beginning the experiments, to find out the manner in which the lands of Gopinathpore pergunnah had been classified. I therefore selected for experiments fields situated in different parts of the village Kandi Gopinathpore, at which I first commenced to work. These fields were all classed as Anal in the chitta of the late measurements, though, according to the villagers, they belonged to different classes. As regards the other villages, it seemed to me that the best plan to form a correct idea of the productive powers of the different classes of lands in the different parts of pergunnah Gopinathpore was to conduct experiments in several villages. But as, in consequence of the short time within which it was possible to make experiments, I could not personally conduct all of them, I thought that, as I had not under me any officer of the grade of sub-deputy or canongoe, the only way in which I could carry on simultaneously experiments at more places than one was by making a greater use of my clerks and moolvies than was contemplated in the instructions. But as this plan did not recommend itself to the Board, it was abandoned, and no additional establishment kept for the purpose of making experiments, which were, with the exception of a few that had been made at the commencement, all conducted in my presence.

6. *Experiments in villages Gopinathpore and Raibati.*—*Plan I.*—The village in which the experiments have been of an exhaustive character is Kandi Gopinathpore. I beg to submit herewith a plan (No. 1) showing the fields, on the rice of which experiments were made in Gopinathpore and the adjoining village called Raibati. While the crops of fields Nos. 1, 2, 6, 7, and 10 were experimented upon, I could not, for want of a tent to live in, remain present at each experiment from its beginning to end, though I personally supervised the work several hours every day. But during the experiments on the rice of fields Nos. 3, 4, 5, 8, 9, 11, 12, 13, 14, 15, 16, 17, and 18, I lived where I worked, having procured at this time two tents, in one of which I lived and in the other held office. The field marked (W) is the piece of ground on which the rice was stacked, thrashed, winnowed, and weighed. On the adjoining fields 1 and 2, the rice of which had been previously cut, stood my tents. The thrashing, winnowing, and weighing were done under my own eyes, while the cutting was done within my cognizance, i.e., within easy distance of my tents and under my constant supervision. I always visited the fields while the rice was being cut, and a trustworthy mullah remained guard from beginning to end. All the rice after being cut was tied together in separate bundles, and these bundles were once counted on the field and again on the thrashing ground. Thus every possible precaution was taken to prevent fraud. When all the rice of a field was thrashed out and the chaff winnowed away, the paddy was weighed (not measured) with seers weighing 80 tolas each.

7. *Experiments in Village Thira.*—*Plan II.*—On the completion of the experiments in Gopinathpore, I removed my tents to Thira (written Kheera in the survey map). When I arrived at this village, I found that the rice in the uplands had been cut and that those that remained uncut were in the low *bedy* lands which formed the greater part of the area of the village. All the care and vigilance exercised at Gopinathpore were also exercised at Thira, where all the operations took place under my very eyes. Here too I lived where I worked, as will appear from Plan II, herewith enclosed, shewing the fields, on the rice of which experiments were made. On the plot of ground marked W, the rice was thrashed and weighed, and here also stood my tent.

8. *Measurements of fields experimented upon how conducted.*—The fields shown in Plans I and II were measured and plotted either by me or in my presence, and under my supervision, by a clerk who knows surveying. In order to secure more correct areas than could be obtained by adopting the scale (16"=1 mile) ordinarily used in settlements, measurements have been plotted on double that scale, i.e., on the scale 32"=1 mile.

9. *Actual average outturn per bigha of fields experimented upon.*—The actual outturn of rice, together with the area of each field, will be found in the statement given on the margin of each plan where the outturn per bigha has also been given. It is not easy to strike an actual average outturn per bigha regarding the fields (Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17, and 18) experimented upon in village Gopinathpore. All these fields, according to the chitta of the last measurement, belong to the first class; but this is denied by the ryots. As regards the character of the soil, I have not perceived much difference between one plot and another. But proximity to, or remoteness from, a tank is a material thing that decides in these places the quality of the land. My experience of the eastern districts of Bengal did not lead me to imagine that rice fields were irrigated. But here ryots do not, as a rule, fail to take advantage of the proximity of a tank in irrigating their fields, especially in years of deficient rainfall. But in arriving at an accurate idea regarding the productive powers of the soil, the accidental advantage derived from proximity to tanks should not be taken into account. Following the above principle, I shall not bring under calculation the outturn of rice of

fields Nos. 1, 2, 4, 5, 17, and 18, which were to a more or less extent irrigated with tank water. Fields Nos. 3, 6, 7, 8, 9, 10, 15, and 16 are the proper representatives of the class, the difference of their outturns being due to the different times of sowing and the different degrees of care and labour subsequently devoted to their cultivation. Field No. 16 is the instance of how a *bataidar* is apt to neglect the field he cultivates of another person on the condition of paying him by way of rent half the produce. The ryot to whom this field belongs is a Brahmin, and the actual cultivator (the *bataidar* called in these places *bhagidar*) did not think of cultivating it until he had finished his own fields, by which time the sowing season was over.

The actual average outturn per bigha of the fields experimented upon in Gopinathpore is therefore found in the following manner:—

Number of field in the plan.	Annual outturn per bigha.	
	Mda.	Sra.
3	4	35½
6	5	23½
7	5	16
8	5	18½
9	3	37½
10	4	11
15	1	13½
16	5	25
Total outturn for eight bighas in eight fields	36	19
Average outturn per bigha in the village	4	21

Fields Nos. 11, 12, 13, and 14, in Plan I, belong to the adjoining village Raiabati. The average actual outturn for these fields is found in the same manner to be 3 maunds 1½ seers per bigha.

The fields of Thira (Plan II) belong all to the same class, and the average actual outturn for them is found to be 7 maunds 21 seers.

10. *No statistics of any previous enquiry available for estimating average outturn per bigha.*—The actual average outturn per bigha for the fields experimented upon in the three villages being found in the above manner, the next point for enquiry is the *estimated* average quantity of produce and of the price obtained for it by the ryot for a number of years. This is to be ascertained by enquiry, and tested by such statistics as are available of the result of similar experiments, and by the conclusion arrived at by similar enquiries.* For the purpose of section 23 (b) of the Bill the Board have ordered that “five years would be a reasonable period on which the average might be calculated.” I have, accordingly, tried to estimate the average quantity of produce and the value thereof for the last five years. But, though I have obtained very accurate information regarding the price of rice for the last five years, I have not been able to get any information regarding the average quantity of produce for any previous year. No enquiries regarding produce were made at this place at any previous time, and so no data are available which might help the present enquiry. I have therefore been obliged to accept the guesses of the ryots as correct. These guesses may, on the whole, be not very far from the truth.

11. *Average outturn per bigha estimated from the statements of ryots, checked by rainfall register of Kandi Charitable Dispensary.* I have been able to a certain extent to test the accuracy of the statements of the ryots regarding the yield of previous years with the aid of the rainfall register, for which I am indebted to the kindness of Babu Chandra Kumar Gupta, Assistant Surgeon of the Charitable Dispensary at Kandi. The following statement shows the monthly rainfall at Kandi during eight years, counting backwards from 1882:—

Statement showing the monthly rainfall at Kandi Gopinathpore in the years 1875 to 1882.

Year.	January	February	March.	April	May.	June.	July.	August	Septem- ber.	Octo- ber.	Novem- ber.	December.	TOTAL
1882	..	..	0.01	0.55	5.80	11.65	5.12	7.87	0.34	7.41	..	..	46.55
1881	..	..	1.34	..	5.09	7.00	11.17	10.87	5.21	4.17	..	..	47.48
1880	..	5.01	0.80	2.13	6.22	7.45	0.08	11.62	10.40	4.81	..	..	51.58
1879	..	1.71	..	..	1.64	14.16	22.01	8.57	12.58	5.08	..	..	66.54
1878	0.37	0.50	0.12	1.78	5.07	6.79	0.88	15.34	18.37	1.21	3.83	..	53.71
1877	2.08	1.38	0.67	2.54	2.64	7.01	16.19	10.87	7.08	1.70	..	..	50.30
1876	..	..	0.52	3.30	2.02	0.48	17.76	13.08	6.47	8.35	..	..	52.20
1875	..	..	..	..	5.88	17.50	8.18	11.06	0.65	0.77	..	..	53.09

* The register for the first four months of this year not forthcoming.

It will appear from the above statement that only 46.55 inches of rain fell in Kandi from 1st January to 1st October 1882. The normal quantity of rainfall for the district of Moorshedabad is 58 inches (*vide* page 266 of Mr. MacDonnell's report on the famine of 1873-74). There was thus a deficiency of 6.45 inches in the rainfall of the past year to make up the total normal quantity. The rains were also not seasonably distributed, the falls during the months of July and August, when the cultivators wanted them most for transplanting the young plants, were very small, being 5.12 and 7.87 inches respectively. In consequence of the above circumstance, the outturn of rice in the up-lands of this part of the district has been less than the average quantity (about eight annas less), while that in the low lands has been somewhat

more than the average. The ryots of Gopinathpore state that this was also the state of things in the two preceding years, 1881 and 1880. But the ryots of the more favourably circumstanced village, Thira, deny that the crops in 1881 and 1880 were so good as in 1882, though they admit that, on the whole, those were not bad years. Now, here again the rainfall register is of much use. This register shews that the total fall in 1881 was almost the same as in 1882. It was only 47·49 inches. But as the quantities for May, July, and August exceeded in 1881 the quantities for the corresponding months of 1882, the outturn for 1881 seems to have been as good as, if not better, than that which has been found from experiment in 1882. The rainfall for 1880 was 51·26, just the quantity considered normal for Moorshedabad; though the falls in each of the months of May, June, and July in 1878 hardly exceeded five inches. Under the circumstances of the case it may not be very far from the truth if the outturns for high lands be put down for 1878 and 1879 as having been $1\frac{1}{2}$ times those for 1880, 1881, and 1882.

But if the difficulties in estimating the average outturn per bigha of ordinary high land for 1878 and 1879 are great, those for estimating the outturn of low *berly* lands are still greater. The cultivation of low lands is attended with more risks than that of high lands. The floods, when too high or too long prolonged, do greater damage to the crops of low lands than the droughts of an equally excessive character do to high lands. Though all the lands of Thira are not low, and the low lands do not exactly form the bed of a *berly*, they are low enough to be damaged to a great extent by any excessive rise of water. It is admitted that the outturn in 1881 in the *berly* lands of Thira was as good as it was in 1882; but it is said that in 1880 the outturn was somewhat less, and that in 1879 and 1878 it was still less, not even half of what it is in ordinary years. Taking the above circumstances into consideration, the average outturn for Thira for these years may safely be estimated for 1880 at $\frac{1}{2}$, and for 1879 and 1878 at $\frac{1}{4}$ th of what it has been in 1882.

Now, calculating the average outturn for the past five years for the three villages, the crops of which have been experimented upon, the following results are obtained:—

Gopinathpore, called also Kandi Gopinathpore—

	Mds.	Srs.
Actual yield per bigha in 1882, found from experiments	4	21
Estimated yield per bigha for 1881, same as in 1882	4	21
Ditto for 1880, same as in 1882	4	21
Ditto for 1879, $1\frac{1}{2}$ times the yield for 1882	6	31
Ditto for 1878, ditto ditto	6	31
Total estimated outturn of five years for one bigha	22	5

The estimated average annual outturn per bigha for the last five years is therefore $\frac{22 \text{ Mds. } 5 \text{ Srs.}}{5} = 5 \text{ maunds } 17 \text{ seers.}$

In the same manner the average annual outturn per bigha in Raibhati is also found:—

	Mds.	Srs.
Actual yield in 1882	3	13
Estimated yield in 1881	3	13
Ditto in 1880	3	13
Ditto in 1879, $1\frac{1}{2}$ of 1882	4	20
Ditto in 1878, $1\frac{1}{2}$ of 1882	4	20
Total estimated outturn of five years for one bigha	18	23

Estimated average annual outturn for one bigha = $\frac{18 \text{ Mds. } 23 \text{ Srs.}}{5} = 3 \text{ maunds } 20 \text{ seers.}$

Thira.

	Mds.	Srs.
Actual outturn per bigha in 1882	7	23
Estimated ditto in 1881	7	23
Ditto ditto in 1880, $\frac{1}{2}$ of 1882	7	23
Ditto ditto in 1879, $\frac{1}{4}$ of 1882	2	33
Ditto ditto in 1878	2	33
Total estimated outturn of five years for one bigha	26	14

Estimated average outturn per bigha for the last five years = $\frac{26 \text{ Mds. } 14 \text{ Srs.}}{5} = 5 \text{ maunds } 10 \text{ seers.}$

12. *Average price of a maund of rice in the bazar of Kandi Gopinathpore for the last five years.*—The average annual gross produce per bigha being determined as above, the average money value of that produce has to be now determined. I am glad that in prosecuting this part of the enquiry, I have been fortunate enough to get very correct information from the *khatas* or account books of certain grain-dealers of Kandi Gopinathpore bazar. As the ryots of Gopinathpore, Raibhati, and Thira, in which experiments have been made, sell their rice at this bazar, which, as will appear from sheet No. 10, is close to their homes, the buying prices entered in the accounts of the shop-keepers may be taken as those at which the ryots sold

their rice in the months of December, January, February, and March, for which enquiries have been made. The analysis of the accounts of the shop-keepers gives the following results:—

			Rs. a. p.
Average price of a maund of common rice in the months of Poush, Mugh, Falgun, and half of Chaitra of 1285 (B.S.) corresponding to December of 1877, and January, February and March of 1878			
Ditto	ditto	of 1878-79	2 6 6
Ditto	ditto	of 1879-80	1 9 3
Ditto	ditto	of 1880-81	1 3 8
Ditto	ditto	of 1881-82	1 6 2
Total of five years			7 12 7

Average price of a maund of rice during the past five years = Rs. $7\frac{12}{5}$ = Re. 1-8-11.

13. *Average money value of gross produce per bigha.*—With the aid of the estimated average yield per bigha given in the preceding paragraph 11, and the average price of rice per maund, for the past five years, given in paragraph 12, the average money value of gross produce can be found if the proportion of husked rice obtained from a maund of unhusked rice or paddy as known. I have not yet been able to make any experiments at husking; but for the purpose of the present calculation, it may be sufficient if the ratio ($2\frac{1}{2}$ seers of rice to a maund of paddy), given at page 290 of the Statistical Reporter, be taken as also applying to the rice lately experimented upon.

This gives the following results for the three villages:—

<i>Gopinathpore</i> —	
Estimated average outturn per bigha	= 5 maunds 17 seers of paddy = 3 maunds 34 seers of rice.
<i>Rasabati</i> —	
Estimated average outturn per bigha	= 3 maunds 29 seers of paddy = 2 maunds 26 seers of rice.
<i>Thira</i> —	
Estimated average outturn per bigha	= 5 maunds 10 seers of paddy = 3 maunds 29 seers of rice.

The average price of a maund of rice being Re. 1-8-11, the money value of the average gross produce in the three villages will be as follows:—

		Rs. a. p.
<i>Gopinathpore</i>		
Rice 3 maunds 34 seers, at Re. 1-8-11 per maund		6 15 11
Straw		1 8 0
Total money value		7 7 11
<i>Rasabati</i> —		
Rice 2 maunds 26 seers, at Re. 1-8-11 per maund		4 2 0
Straw		1 0 0
Total money value		5 2 0
<i>Thira</i> —		
Rice 3 maunds 26 seers, at Re. 1-8-11 per maund		5 12 8
Straw		1 8 0
Total money value		7 4 8

14. *Enquiries made regarding existing and previous rates.*—In paragraph 5 of your letter No. 1419A., dated the 15th December 1882, I am directed to proceed under paragraph 8 of the instructions in determining the average incidence on the bigha. This paragraph runs as follow:—

“Where the jumma bundis or other papers of the estate do not specify the rates paid for each class of land, the rate officer will ascertain by local enquiry whether any such classification is recognised in the rent arrangements between the zemindar and his ryots, and if so, will record them. Otherwise he will only record such facts as that rents are settled without reference to such classification, the average incidence on the bigha being at such a rate.”

I have agreeably to the above, previous to recording that the rents were settled without reference to classification, made local enquiries as to whether “any classification is recognised in the rent arrangements between the zemindar and his ryots.” But the zemindar, the Nabab, has no information to give regarding rates, having made no jumma bundis of the mehal. Gopinathpore was, I am informed, purchased by a relative of the Nabab Nazim, at a sale for arrears of revenue, about 10 years ago. During these 40 years there has admittedly been no change in the rents, which continue as they were previous to the purchase. No information as to how the present rents were fixed can be obtained from the zemindar. Some of the ryots, however, seem to know from tradition the rates of the different classes of lands held by them. But few will tell what those rates are, and as the statement of one does not agree with that of another, and there is no means of testing the accuracy of such statements, it is altogether hopeless to get at any correct information regarding the rates of rents on which the present rents were fixed.

Having come to know that there were in the Moorsshedabad Collectorate certain rate papers of Gopinathpore and other adjoining estates, prepared by canoongoes under the old system, I applied to the Collector of the district for copies of those papers regarding pergunnah Gopinathpore, and the Collector has been kind enough to furnish me with them. It appears from these papers that there once existed in ancient time rates for different classes of land for all the villages of pergunnah Gopinathpore. It does not appear from the copies when the originals were prepared, or under what circumstances they were prepared; but there can be no doubt that as they were prepared under the old canoongoe system, they must be upwards of 50 years old. The rates given by the canoongoes were, as will be seen from below, too many, and in some cases rather too exorbitant, even considering that the productive powers of some of the lands were, 50 years or 100 years ago, much greater than what they are now.

The following are the rates given by the canoongoe papers of the villages operated upon:—

Kandi Gopinathpore.

	First class.			Second class.			Third class.			Fourth class.		
	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.
Shali haimantie dhan	4	0	0	3	0	0	2	0	0	1	8	0
Mustard, &c.	1	8	0	1	0	0						
Sugarcane	1	0	0	3	0	0	2	0	0	1	8	0
Mulberry	8	0	0	7	0	0	6	0	0	5	0	0
Bastoo	10	0	0	8	0	0	6	0	0	5	0	0
Udbastoo (garden)	5	0	0	3	0	0	2	8	0			

Rasabati.

Dhan	2	0	0	1	8	0		
Sugarcane	2	0	0					
Mulberry	3	0	0	2	8	0		
Bastoo	5	0	0					
Udbastoo	2	8	0					

Thira.

Dhan	1	4	0	1	0	0	0	12	0	0	8	0
Sugarcane	2	0	0	1	8	0						
Mulberry	3	8	0	2	8	0						
Bastoo	1	0	0	3	8	0						
Udbastoo	2	0	0	1	8	0	1	0	0			

In the face of the above classifications of rates, on the basis of which the present rents may have been fixed at a time which cannot now be traced, but which nevertheless is very ancient, it will not be fair to proceed on the system of average rates, which at best must work unequally on ryots holding lands of different classes in different proportions, though it is impossible now to determine the classes of lands for which the rates were fixed.

15. *The principle of averages followed by Mr. Reilly in the settlement of the Chanchal estate does not apply in the present case.*—As far as I am able to understand, the case of Gopinathpore is similar to that of the Chanchal estate in Maldah. But the method adopted by Mr. Reilly in the settlement of that estate will not apply in the present case. In Chanchal, Mr. Reilly first made “a rough calculation of the average rate per bigha hitherto paid for lands in a village” from the area under cultivation by each tenant. In doing this, he did not find much difficulty; but, “the real difficulty arose,” he says, “in portioning off the different plots under the three respective classes, the ryots naturally objecting to have any of their lands included in the higher classes.” Mr. Reilly met this difficulty in each individual case when objections were raised, by instituting a sort of informal punchayet, &c.” (note paragraph 11 of Mr. Reilly’s report No. 268, dated the 15th October 1882). Now, it will be seen that the real merit of Mr. Reilly’s settlements lay not in adjusting rates of rents to classes of lands, but in arranging in each individual case, the classes of lands which a holding should comprise, in order to suit the rates of rents fixed by him. It is not that the lands were first classified according to their productive powers and the rates then fixed for each class, but the rates were first fixed and the classes arranged so as to suit the case of each individual ryot. Moreover, while Mr. Reilly had not to accurately determine the rates previously paid in making what was in fact a new settlement, concluded in a somewhat arbitrary manner, the accurate determination of prevailing rates is indispensable in starting with the enquiry as to how far an increase or decrease in the present rates would be fair and equitable.

16. *Average rate per bigha determined from total rent and area.*—Following the instructions of the Board, I have tried to find in one of the villages, Gopinathpore, the average incidence on the bigha from rents and areas of holding; and I beg to give below the results

obtained according to this method in the case of a few of the ryots of Gopinathpore, whose rents, as entered in the jumma-wastel, have been verified after personal enquiry:—

	NAME OF RYOT.	Area of holding			Total rent of holding			Rent per bigha.		
		R	a.	p	R	a.	p	R	a.	p
A		18	12	0	37	1	0	2	0	0
B		1	15	0	5	8	0	2	14	0
C		16	18	0	44	0	0	2	9	0
D		18	7	0	42	14	0	2	6	0
E		38	11	0	66	7	0	1	11	0
F		15	5	0	34	12	0	2	4	0
G		11	4	0	26	3	0	1	13	6
H		6	18	0	36	0	0	6	3	0
I		1	11	0	2	12	0	1	11	6
J		4	10	0	10	8	0	2	5	4
Total of ten holdings								24 12 10		

The average rate obtained from the above is Rs. 2-5 a bigha, which may be accepted as representing the state of things in village Gopinathpore. But as there is often very great difference between the average rate of one ryot and of another, it may not be fair to accept Rs. 2-5 as the basis.

17. *Jumma-bundis of adjoining estates not yet referred to.*—I have not yet been able to refer to the jumma-bundis of the adjoining pergunnahs Futtehsing, Mahlundi, and Radha-bulhabpore. Some of the putwaris of Mahlundi, on whom I called for the jumma-bundi papers of the villages, the rents of which were collected by them, said that they had no jumma-bundis; that all the papers were with the zemindars themselves. If the Board should think that the jumma-bundis of the above-mentioned pergunnahs should be referred to in the course of the present enquiry, I beg to request that I may be authorized, under section 31 of Regulation XII of 1817, to call for those papers from the zemindars.

18. *Instruction solicited.*—In conclusion, I beg to state that, as under the circumstances described above, it is not possible to determine the rates on which the present rents were fixed, nor also the time when they were fixed, I do not know how to proceed further in the preparation of the table of fair and equitable rates which is the ultimate object of the present enquiry. Should the Board order me to proceed upon the principle of average incidence per bigha, I would request them to be good enough to instruct me as to the period to be embraced in the enquiry regarding increase or decrease in productive powers and value of produce, seeing that it cannot be traced when the present rents were fixed.

No 59, dated Dumri, the 21st January 1883 *Via Doodraon.*

From—H M TORIN, Esq., C.S., on Special Duty, Shahabad,

To—The Secretary to the Board of Revenue, Lower Provinces.

In submitting my third fortnightly report I regret the delay that has arisen in despatching it; as I have already informed you semi-officially, this was owing to illness.

2. Since the submission of my last report, I have had the opportunity of consulting Mr. Nolan, the Collector of Shahabad, on the whole subject, and I beg to enclose a copy of a letter that I have subsequently received from him.

3. My last report referred to the southern portion of the tract assigned to me; and with reference thereto I drew the following conclusions:—

- (a) That it is impossible to frame fair and equitable tables of rents, according to the rules framed and issued by the Board for any considerable portion of the tract.
- (b) That in those villages where the existing rates are numerous, they are in many instances not in proportion to the real value of the land.
- (c) That in those villages where there is uniformity of rates, the same rate has been applied to different soils indiscriminately without regard to their relative value; and consequently existing rates form no sound basis for the formation of a fair and equitable scale, as proposed by the rules.
- (d) I point out that where the rates were uniform, there would be no difficulty in applying the laws of enhancement proposed in the Bill to the existing rents, and so constructing a table of rates of rent which could be demanded for the great portion of the village lands by the zemindars; but that such a table would not be the table of fair and equitable rates contemplated by the rules.

4. I now have to report on the difficulties in the way of forming fair and equitable tables of rates in the northern tract.

Before doing so I will ask your permission to correct a misconception which has arisen somewhat naturally from my last report, and which finds utterance in the 7th paragraph of your letter No. 23A to the Government of Bengal. I did not overlook the circumstance that the legal presumption arising by occupation at unchanged rates for more than 20 years has had the effect of turning each holding into one held at rates which are no longer liable to alteration. But I regret that I did not then bring more prominently to notice the circumstances of the large proportion of lands which the ryots are entitled to hold at fixed rates.

I have pointed out in my letter No. 45 that the occupancy ryots and those with the right to hold at fixed rates hold at one and the same rate. New ryots have been admitted to lands at the old prevailing rate, and though the rate has not been changed for more than 20 years, many of the existing ryots are new comers. Such ryots therefore could not be treated as holding at fixed rates.

It is at the same time much to be regretted that a tract was selected in which such a large proportion of the ryots (probably over 50 per cent.) are entitled to hold at fixed rates.

5. The northern tract is simpler to deal with than the southern, inasmuch as the rents in each village are less numerous, and every village has one or more prevailing rates of rent.

6. In almost all the northern villages the rates have not been altered for forty years. In fact there has been still less change here than in the southern tract.

7. In most of the villages the same difficulty, as is referred to in clause c of paragraph 3 of this letter, is met with, *viz.*, that the same rate prevails for several or all classes and qualities of land, and therefore existing rates form no sound basis on which to construct rate tables which are to be fair and equitable under the rules.

8. The lands in several of the villages have been affected by recent river action, and lands which were properly assessed at different rates years ago, as being of different qualities and classes, have now greatly altered in character.

I annex a list of the villages in the northern tract with the rates prevailing in each. In drawing up this table I have omitted any very small quantities of land held at rates other than the prevailing ones with the exception of *daknails*; in no cases do such lands form more than a small proportion of the whole cultivated area, and in almost all cases it will be found that they are held under special circumstances, or that they could in a detailed settlement of the *jama-bandi* fall under one of the prevailing rates.

9. To show how unreliable existing rates are in most cases for the purpose of forming a fair and equitable rate table even in a single village, I will give a few examples.

In Dohia the men of one "tola" cultivate at Rs. 7-8 and Rs. 7-12 per bigha the same land that the men of another "tola" till at Rs. 3-12 and Rs. 5 per bigha. In Sirkhigdi Rajah, forming part of Nag Singhanpura, the "deara" and "upermar" lands are both held at Rs. 1-13. The former yields about 15 maunds per acre; the latter about 7½ maunds per acre. In Rani Singanpura, tal land, yielding about 14 maunds per acre, and "baidhus" (high) land, yielding about 11 maunds per acre, both pay at the rate of Rs. 3-6-3 per bigha.

In Chakandi, forming part of Rampur Ukhari, in tal (low) lands the prevailing rates are Rs. 2-8 and Rs. 4; in some cases the lands held at these different rates give the same outturn, and in some cases the land at Rs. 2-8 gives a greater outturn than the other.

It is needless to multiply illustrations. The same state of things exists with regard to the majority of the lands in each village.

10. The rates, as the Collector has pointed out, are the ancient custom of the village, and now depend on custom and nothing else; though it is clear that in some villages (*e.g.*, Dea Mau, Rampore Ukhari, Dumri, Khara tane, Nagarpura) some attempt was originally made to adjust the rents to the value of the soils.

In some of the uplands, where river action has not been so much felt, the variations of rates thus adopted according to the value of the soil still hold good, but the lands in which this is the case form a very small proportion of the whole.

11. I am satisfied, then, that it is impossible to form in this tract even for single villages fair and equitable tables as contemplated by the rules; still more impossible would it be to form them for larger areas. A glance at the map which I send herewith, on which the prevailing rates for both low lands (tal and deara) and high lands ("upermar") are given, or the perusal of table A annexed, will demonstrate this clearly.

There is no variation in the outturn from tal and deara lands corresponding to the variations in the rent, and the same remark holds good for the greater part of the "upermar" lands also.

12. I have therefore come to the conclusion that a table of fair and equitable rates, such as is contemplated by the rules, is an impossibility in the northern as well as in the southern tract.

Unless, therefore, I receive orders to the contrary, I shall not continue to attempt to prepare such a table.

13. While being of the above opinion I still think that the idea of the table of rates as originally intended by the Rent Commissioners (if I understand it rightly) might with some modification be applied with advantage to many villages in a tract like this, where there are uniform rates.

Existing rates were taken by the Commissioners as a basis, and the rules of enhancement and abatement proposed by their Bill were supposed to be applied thereto. Such a procedure could readily, and in conformity with existing law, be applied to most of the villages here.

14. The advantage of such a procedure is obvious; the rates for nearly the whole of a village (excepting these lands not now held at the prevailing rates) would be settled together, and the rate would be authoritative and hold good for ten years.

The Collector in his letter referred to above has stated (paragraph 6) that for such villages he would declare existing rates increased in proportion to the rise in the value of staple crops to be fair and equitable.

This is almost the same as I now propose to do, except where there is clear evidence of increase or decrease in the productive powers of the soil.

15. Where rates have been settled more recently, the new rates would be fixed on the same principles, but in the case of lands in which the existing rate has been settled during the last ten years, I would, following the principles of the Commissioner's draft Bill, leave the existing rate alone.

One point that would be unsatisfactory in this procedure is that the lands falling under each new rate could generally only be designated as "those hitherto paying such and such rates."

16. I await the orders of the Board as to whether they wish such a table to be drawn up for each village where it is possible.

17. In conclusion, I would refer to one or two other points of interest. The crops most grown in the northern tract of my area is peas, and it would be a staple. I have had some difficulty in obtaining accurate figures as to the prices of peas in past years. The price is not given in the weekly price current submitted to Government. In the case of other grains I have found the Gazette figures the safest to adopt for prices, as I find them on the whole far more accurate than those price currents which I have been able to compile from other sources.

18. With reference to Mr. Nolan's remarks about the good qualities of the Bhojore ryots, I agree with him in what he says of their manliness, independence, and prosperity. I must, however, demur to what he says as to their industry and good cultivation. They have in past years held more land than they could cultivate properly; they generally select the crop that requires least cultivation, viz., peas, although it commands a very low price and does not yield a greater outturn than other crops. In those lands where Brahmin, Rajputs, and Bhunhas have been superseded by more industrious castes, I notice a marked difference in the care with which the land is cultivated. I will, however, refer to this matter when submitting my final report.

19. I shall now proceed to complete my enquiries for four villages which I have taken up in addition to those in my original list as approved by the Board, in your No. 1079A, dated 5th December 1882. I am also proceeding to complete and despatch the reports required on the subject of staple crops and special crops, and to complete my enquiries into the increase of prices during the last forty years which has necessitated careful search.

20. Meanwhile I await orders on the points raised in the earlier portion of this report.

21. The return of the maps is requested.

TABLE A.

NAME OF VILLAGE.	Total of land settled according to Jomalsund.	PREVAILING RATES FOR UPPEMAN.		PREVAILING RATES FOR TALUK "DEHRAJ."		GRAND TOTAL.	REMARKS.
		Rate.	Quantity.	Rate.	Quantity.		
		R a. p.	Bighas.	R a. p.	Bighas.		
1. Dakniah, including— a.—Bhakerit Singh b.—Kampeer	1,955	3 4 0	51	...	...
		3 1 0	25	...	...
		2 14 0	507	...	...
		1 8 0	206	...	...
		1 0 0	132	...	...
		2 0 0	500	...	...
TOTAL	...	...	1,430	...	...	1,430	
2. Damau Jakro	200	...	...	3 4 0	101		
		...	...	2 8 0	49		
		...	...	1 4 0	49		
TOTAL	...	...	...	...	199	199	
3. Hathabpoor	...	3 0 0	47	...	...
		2 14 0	12	...	...
		2 4 0	8	...	...
		2 0 0	138	...	...
		1 8 0	44	...	...
		1 4 0	14	...	...
TOTAL	...	...	276	...	...	276	

NAME OF VILLAGE.	Total of land settled according to jumabandi.	PREVAILING RATES FOR UPHAMAR.		PREVAILING RATES FOR TALUK "DUMRA."		GRAND TOTAL.	REMARKS.
		Rate.	Quantity.	Rate.	Quantity.		
		R a. p.	Bighas.	R a. p.	Bighas.		
4. Deaman	911	3 0 6	642	3 8 0	221		
		2 0 0	70	1 0 0	40		
TOTAL	...	...	612	...	261	873	
5. Dea Pernesser, including Monchepe	1,010	2 6 0	484	4 0 6	63		
		...	...	4 0 0	16		
		...	...	2 6 0	334		
TOTAL	...	...	401	...	413	877	
6. Dumri, including Biraulumpoor	1,673	4 1 0	50	5 8 0	8		
		3 5 0	815	4 1 0	331		
		2 1 0	25	4 0 0	31		
		...	...	3 1 0	100		
		...	...	3 0 0	110		
		...	...	1 1 0	24		
TOTAL	...	...	891	...	604	1,494	
Durasum	427	3 4 0	413	...	...
TOTAL	...	...	413	...	...	413	
Rainpoor Ukori, including—	1,146	3 10 0	19	4 0 0	55		
a.—Chukandi		3 8 0	247	5 0 0	10		
b.—Raudhumpoor		3 4 0	289	2 8 0	80		
c.—Misoulia		3 0 0	190	...	...
d.—Salempoor		2 12 0	74	...	...
e.—Pitamberpoor		2 8 0	25	...	...
TOTAL	...	...	844	...	145	989	
7. Khoba	...	...	...	4 0 0	48	...	This village has much blank land, and except for the land entered the other rates vary from year to year.
8. Bani Singhanpoora, including—	587	3 6 3	200	3 6 3	220		
a.—Kusarcha		3 0 0	97	...	...
TOTAL	...	...	297	...	220	517	
9. Kashi Singhanpoora	173	2 6 0	...	2 6 0	...	122	
		2 4 0	...	2 4 0	...	11	
		1 11 0	...	1 11 0	...	17	
		1 1 9	...	1 1 9	...	8	
		1 0 0	...	1 0 0	...	13	
TOTAL	...	...	...	...	...	171	
10. Nag Singhanpoora, including—	1,590	2 4 0	...	2 4 0	...	1,088	
Dhanepoor		1 13 0	...	1 13 0	...	479	
Sirkhandi Biss		...	...	...	...
Sirkhandi Rajah		...	...	...	...
Gasowli		...	...	...	...
Nag Bheria		...	...	...	...
Narampoor	...	...	...	...	...	1,567	
Harpoor	...	...	...	...	...
TOTAL	...	...	...	...	...	1,567	
11. Nagurpoora	315	2 4 0	102	2 4 0	10		
		2 2 0	85	2 2 0	7		
		2 0 0	9	2 0 0	3		
TOTAL	...	...	196	...	19	215	

Name of Village	Total of land settled according to zamabandi	PREVAILING RATES FOR UPPERMAH		PREVAILING RATES FOR LAL OR 'Bhara'		Grand Total	Remarks
		Rate	Quantity	Rate	Quantity		
12. Bharkusa	188	R a. p.	Bighas	R a. p.	Bighas		
TOTAL		3 3 0	152	.		163	
13. Nag Inuria Khoord				4 0 0	80		
TOTAL				3 0 0	272	352	
14. Kharatoru	1,137	2 12 0	62	6 8 0	15		
		2 1 0	5	6 0 0	201		
		1 8 0	63	6 8 0	29		
		2 0 0	25	4 8 0	704		
TOTAL		...	161	3 12 0	24	1,134	
15. Dhoobha	377			8 0 0	2		
				7 12 0	91		
				7 8 0	116		
				6 12 0	12		
				4 0 0	58		
TOTAL	..	..		3 12 0	31	343	343
16. Ganguli	302			5 0 0	239		
TOTAL		...		3 12 0	63	301	301
17. Chatanpoota	40			5 0 0	21		
TOTAL				1 0 0	19	40	40
18. Lemun	108	3 8 0	36	4 2 0	17		
		2 0 0	4	3 12 0	16		
		1 8 0	31				
TOTAL		..	74		33	107	
19. Nag Amatta Khoord	125			3 9 0	125	125	

H. M. TOBIN.

No. 17 CWT, dated Camp Beloute, the 15th-17th January 1883.

From—B. NOELAN, Esq., Officiating Collector of Shahabad,

To—H. M. TOBIN, Esq., on Special Duty, Bhojpur.

I do myself the honour to offer some observations on the subject of your enquiry as to the preparation of tables of rent rates in the selected tract of Bhojpote pergunnah, as to which we have had much communications while in camp together.

2. I agree with you in considering that there is not in this area as a whole, or in any group of villages within it, any thing which can be called a "prevailing rate" of rent within the meaning of Act X of 1859. The rent rates have been fixed by villages not by larger areas, apparently at different times, and without reference to any common standard. The inequalities originally existing have been increased by time, which has altered the circumstances, while the rent has, for the most part, remained the same in the important matter of moisture in particular, according to their power of retaining, and their position for receiving which in clean soils are often classified. There has been a complete change, the Ganges and Kae rivers having shifted their courses, and the canal embankments having altered the whole drainage of the country, and raised the level of the sub-soil water. Moreover, the industry of the ryots has created farm, buildings, wells, gardens, and orchards, with other improvements, raising in various

decreases the value of the land. Such connection as at first existed between the rent rate and the intrinsic value of the soil has thus been altogether destroyed. The sole standard of the existing assessment is the custom of the village.

3. Such being the case, I believe that there can be no justification for any attempt to enhance the existing rents to the standard of any prevailing rate other than that of the village. There is no prevailing rate for any larger area. It would of course be possible to take the average of existing rates, and to enhance the more favoured holdings up to that. This would create a new average rate, up to which, after a period, the lower rents could be again raised, and this process repeated until all the land was subjected to the highest rate now paid anywhere. But I can see nothing fair or equitable in such a process. It would be an encroachment on the rights of property, subjecting the ryots to liability to enhancement on grounds which are not now valid, and were not valid when they purchased or acquired their holdings. And few would consider the augmenting of the Rajah's income a sufficiently pressing object to justify such an interference with the vested interests of almost all the other inhabitants of this area.

4. On the other hand, it appears that occupancy ryots are liable to enhancement in proportion to the rise in prices since their rent rate was last fixed or ascertained. You have not completed your enquiry as to the extent of this increase in prices, or that as to the length of time during which existing rates have prevailed. But it would appear from the papers collected by you, as far as they have been examined, that the existing rates have not in most villages been changed for some 37 years. When this is the case, the landlord, under the rule of proportion, seems entitled to an enhancement in the rates of the rise in average prices during that period. Thus if the price of staple crops has risen 30 per cent., the fair and equitable rent would be, under the proposed as under the existing law, 30 per cent., above the existing rent.

5. This differs from the rate suggested in paragraph 20 of your letter No. 4, dated 1st January, to the address of the Board. You say that if prices have risen 30 per cent. and 10 per cent. has been added to the productive power of the soil by irrigation, making an aggregate increase of 40 per cent., then the enhancement of rent should be half that, or 20 per cent. I believe that the landlord is entitled, under the rule of proportion, to an enhancement on the ground of the increase of prices proportionate to that increase, and not merely to half of such proportion as assumed by you. Such is the present law, which is in this respect re-enacted in the Bill. The rule laid down in the Bill that the ryot shall receive half the benefit of such unearned increment is not thereby violated, as in fact he receives more. If he paid Rs. 10 for a holding 37 years ago, which then produced wheat valued at Rs. 100, and

*Year.	Value of crops.	Rent.	Value of ryot's share of crops.
	Rs.	Rs.	Rs.
1860	100	10	50
	130	13	117

prices having since increased 30 per cent., he is now called on to pay Rs. 13, the crop fetching Rs. 130; he will retain Rs. 117* of the unearned increment, the landlord receiving only Rs. 13. As to the addition of 10 per cent. on account of canal irrigation, I think it should not be allowed. The rent of an occupancy ryot cannot be raised on account of any

improvement effected at his expense, and irrigation is such an improvement, as he alone pays the water rates, which are levied to cover the cost of the canals. This is the rule approved by the Board of Revenue for the Government estates of Nasirgunge in this district.

6. There are some villages in which, I believe, the rates have already been raised, in proportion to the increase in prices, or somewhat more. In these I would declare existing rates fair and equitable; for the others the existing rate, increased in proportion to the rise in the value of staple crops.

7. With regard to the definition of staple crops, the only difficulty in the selected area, where there is little sugarcane, regards the high lands near villages, on which potatoes, opium, and other valuable crops are grown. On other lands, rice, wheat, barley, and peas, with some other crops in particular villages, are clearly staples. The question is whether a special rate should be fixed for the land generally called *deh*, where the best crops are cultivated. I think that this should not be done, and that opium and potatoes should not be considered as staples. The land on which they grow is no better than other land, and the great outturn is simply the reward of great labours, including incessant irrigation from wells on opium lands, and the use of manure for potatoes. The ryot sinks the wells indispensable for opium, and keeps the cattle, &c., which yield the manure for potatoes, while the labour is all his. He is therefore entitled to the increase in the value of the land caused by its vicinity to the wells and cattle sheds.

8. In paragraph 19 of your letter referred to, I notice the observation that "probably owing to former mismanagement in the Raj, the rate of rent paid by occupancy ryots in the tract is very low." I am satisfied that the occupancy ryots sublet their lands at from twice to ten times the "guzashta rate." I have to observe that the term "*guzashta*," which literally means only *old*, is here used in all civil and revenue courts to denote a permanent and transferable tenure at a quit-rent, which can never be raised. It is no wonder that such a tenure can be sublet at a great profit.

9. The peculiarity of the selected tract is that it is cultivated by ryots, of whom a considerable proportion have these *guzashta* rights, while nearly all have occupancy rights, and that the same leniency of the landlord which permitted such privileges to grow up and continue has prevented him from generally enhancing rents on other lands. It is not, therefore,

a good example of the general condition of the district, and I objected to its selection for those enquiries, on the ground that it was not typical, and that there was no prevailing rate. But if in these respects it affords less information than could be wished, its condition is worthy of the attention of the framers of the Bill on other grounds. It is the object of some of the framers of the present Bill to secure for the ryots of Bengal as a body rights of occupancy at moderate rents, which, they contend, would insure superior cultivation through the improvements to be expected from those who enjoy security of title, a certain prosperity in ordinary times, with the credit necessary to enable cultivators to tide over periods of famine without becoming a burden on the taxes, and which would also, it is urged, tend to give to the tenants the independence and manliness of character generally found among peasant proprietors. On the other hand, there are many who believe that low rents and security end in sloth, the sale of the land to speculators, and in the end to sub-letting at a rack rent. It would be most important to ascertain whether in the selected tract the conditions which it is proposed to create elsewhere have led to the results anticipated by the one school or the other.

10. I think that there can be no doubt to such a question. Sub-letting is not unknown in Bhojpur, and some of the cultivators are in debt; but these are exceptional cases. The general rule is that the ryots cultivate their own lands with their own small capital, and where they sell their holdings it is to others of their own class. Their industry is marked, and has resulted in the clearing of the jungle with which much of the land was covered 50 years ago, and the creation of a cultivated area as well planted with fruit-trees, as well irrigated from wells, and as well fenced as any I have seen in India. No one can encamp for a day in the tract without being struck with its exceptional prosperity, which contrasts strongly with the backward state of three parts of the district in which rents are high and occupancy rights unknown. The credit of the cultivators is so good that, as you informed me, they generally borrow at the rate of 12 per cent., that is, on as good terms as their landlord. There would, therefore, be no anxiety whatever as to their surviving without assistance a period of ordinary famine. As to their character, the objection I generally hear to it is that it is too manly and independent. The Bhojpur wrestlers have a name throughout the country, and every man carries the large Bhojpur *lati*, which he can use with great skill. They are equally ready to defend themselves in law courts with which the complication of rights inseparable from any system where the majority possess interest in land has rendered them familiar. I have always found them open, communicative, ready to deal or to serve, and their honesty is proved by the low rate of interest demanded from them; but they have another side of their character for any one who attempts to oppress them.

11. I think that these facts should be brought to the notice of Government as having a certain bearing on the general policy of the Bill. In the area to which your enquiries are confined, it would, I submit, appear that rights of occupancy at easy rents have been followed by comparative industry and prosperity, and with their usual effects in the moral character of those who enjoy them.

12. With regard to your remark that the low rents may be due to mismanagement, I may say that it has been the misfortune of the Indian ryots that so many have considered the raising of rents a proof of business ability. In this instance the ryots have not, as in most estates, been transferred from one purchaser at an auction sale to another, until they fell into the hands of some speculator in land who could enhance the old rents to excess. They remain under the Doonraon family, who have owned the land for centuries. That such a family, wealthy even with existing rents, should have allowed them to remain at a rate consistent with the happiness and prosperity of the dependents, I consider a proof of excellent management, and presume it was under such an impression that Government conferred titles on the late Maharajah and the present manager. I think the Rajah must be better off surrounded by contented and loyal peasantry than he would be if his family increased their income at the expense of alienating the feelings of their tenantry, as others have done. I do not say this as imputing an opposite view to you, but because I think it of real importance that in any public correspondence conduct which contributes to the happiness of the country should be recognised as such. The opinion of the older families as to whether they should respect their own good traditions in this respect, may be represented as wavering under the influence of the example of the new auction purchasers, and an impression that Government regarded their leniency as weakness and mismanagement would have a bad effect.

No. 61, Jaypur, Panchabibi, the 20th—22nd of January 1883.

From—D. J. MACPHERSON, Esq., C. S., Assistant Collector, on Special Duty,
To—The Secretary to the Board of Revenue, Lower Provinces.

I have the honour to submit, for the consideration and orders of the Board of Revenue, a report on the practicability of framing tables of uniform rates of rent in the Jaypur Government estates in the manner contemplated by Government. My remarks are based on such facts as I have ascertained up to the time of writing; but all the information I have been able to gather leads me to the conclusion that it is not at present practicable to frame for this tract of country tables of rates based upon recognised distinctions in the quality of soils.

General Principles applicable to this Tract of Country.

2. The object aimed at is "to adjust rent rates to classes of soils," and the summary nature of the enquiry contemplated by Government, precluding, as it does, "actual investigation and experiment on the fields themselves," necessitates our taking existing rates of rent as the basis for operation, these being "usually governed by two great principles—(1) quality of soil, and (2) production of special crops." In the Jaypur Government estates, however, we have not this basis to serve as a starting-point. There are here no rates of rent at all; and I think I shall be able to show that, even if fair and equitable rates based on soil classifications were framed, it would be impossible, in the peculiar circumstances of this tract of country, to apply them in practice. Rents are here determined by the operation of the principle of competition, in which the cultivators and not the proprietors of the land are masters of the position. And so long as this relation subsists between these two classes, the determination of the rents to be paid can hardly come within the purview of the Rent Bill. The provisions of that Bill relating to rates of rent were, I take it, framed with a view to meeting an entirely different state of things. "As to competition," the Commissioners remark in paragraph 45 of their report, "while population is sparse and land is plenty, when the supply of cultivators is limited and the demand for them is active, the ryots have the best of the position, and can secure favourable terms. As population increases, the tables are gradually turned, and where cultivation of the soil is the only means of subsistence, the ultimate effect of unrestricted competition must be that the landlords can dictate their own terms to the ryots who must either accept them or starve." And the conclusion the Commissioners therefore come to is that "Government could not consistently, with the proper discharge of its functions, leave the settlement of what we shall now call the rents payable by the ryots to the uncontrolled influence of competition." It will not be difficult to determine when the time has come for applying the principles of the Rent Law to the determination of fair and equitable rates of rent in this tract of country. That time can hardly have come so long as the ryots show that they can practically dictate their own terms.

Recognised Classification of soils.

3. In the Jaypur estates and the neighbourhood there is a recognised classification of soils, excluding *basta* or homestead land into two main classes, upland and lowland, the latter being also called rice-land; and each of these are sub-divided into three or at most four qualities. These sub-divisions into qualities are, however, understood only by the headmen and principal ryots—the mass of the peasantry sub-divide each of the two main classes simply into good (*bhata*), middling (*madhyam*), and bad (*manda*) soil. Sandy soil is always *manda*; but what they call middling soil one year, they may designate good soil the next, if it has been well ploughed and manured. So far as it is possible to discover traces of rates of rent based upon soil classification, no distinction has been made between the productive capacity of upland and of lowland. The outturn on the former varies with the degree to which it has been ploughed and manured; and it may therefore be said that there has been no attempt here to fix rates of rent (where such may be discovered) with reference to any other crop than rice. This is the preponderating crop in the tract. *Aman dhan* alone is ordinarily grown upon lowland, that is, on about 45 per cent. of the cultivated area, while *aus dhan* is grown upon 14 per cent. With reference to rice land, it may be observed that in villages liable to inundation the best land occupies a middle level and position between two sorts of land, each sort being sub-divided into second, third, and fourth qualities, the higher sorts are not liable to inundation, and their degrees of fertility vary with the readiness with which water collects upon them at the time most suitable for the rice crop. The lower sorts, on the other hand, are distinguished by their liability to such inundation as is sufficient to destroy the crop which is so liable to destruction that the ryots do not consider it worth their while to plough the land well; the water, moreover, usually rises so suddenly that the land is suited only for *dhan* sown broadcast. On the higher sorts the *dhan* is always transplanted. On the lower sorts the crop comes to maturity only in years in which the deficiency of rain is so great as to give but a poor outturn on the higher land, and in such years they produce better crops than the very best land, and that too in inverse proportion to the quality of the soil. On an average of years, however, the outturn of the lower sorts is equivalent to that of the higher sorts; and for practical purposes, therefore, only four qualities of rice land are recognised. It should be observed that land of a particular quality in one village is not necessarily identical in productive capacity with land described as being of the corresponding quality in another. In such village the best land after *basta* is spoken of as being of the first quality, and forms the standard by which the remaining qualities that may be found in the village are determined.

Rates of Rent.

4. I come now to the consideration of the question of rates of rent. In 1865, Mr. Payter, the farmer of the Government estates, fixed rates of rent in each village, presumably based upon soil classification. This, however, he is understood to have done only in the case of holdings which were cultivated by ryots who had for some time been settled upon them. Those rates may fairly enough have indicated the difference between the various qualities of soil found in a particular village; but there was no correspondence between them and those fixed in a neighbouring village in which the soil may have been substantially the same. In each village the

rates were really determined by what the ryots were willing to agree to, and generally it would appear that they varied according to the quality of culturable waste land in each village. Mr. Payter appears to have induced the settled ryots to agree to rates on the understanding that he would remit, as an act of grace on his part, about 10 per cent. on the rental. The sum so remitted was called '*kazat*,' and it was understood, I believe, that it might be collected in unusually good years; but, as a matter of fact, I am informed that Mr. Payter never actually collected anything on this account. It may be observed that other zemindars hereabouts have adopted the same arrangement, but generally with a view to ensure punctuality in the payment of rents through the risk the ryots would run of being sued for arrears at the full rates to which they had agreed, on the understanding that the *kazat* was not to be levied. Mr. Payter then was able to come to an agreement with the older ryots in 1865 as to the rates at which they should pay rent for the different sorts of land in their holding. In the cases, however, of holdings taken up shortly before that date, and of land subsequently taken into cultivation, it was impossible to apply these rates. In such cases a separate bargain was come to with each person who took up land, an average rate per bigha being generally agreed upon for the whole, irrespective of the various qualities of soil which it might comprise. The whole holding taken up in this way at one time would be described in the *jamdandi* as belonging to that class of soil which, in the case of older holdings, paid a rate corresponding to the average agreed upon. Between 1865 and 1878 the cultivated area in these estates was found to have increased by 37 per cent., so that it may be taken for granted that over a very large portion the rates of rent paid in the latter year were no criterion whatever of the quality of the soil. During this period the rates of rent paid in the older holdings also must have lost almost entirely whatever connection they may have once had with soil classification. Owing to the abundance of fallow and waste land in this part of the country, which the ryots always bargain to get on favourable terms, they seldom occupy the same holding for more than 6 or 7 years in succession. I shall afterwards give figures showing the extent to which these relinquishments have taken place since the last settlement of 1878. Meanwhile, it will suffice to remark that, owing to this custom, rights of occupancy are almost entirely unknown in this particular tract of country, and that relinquished land can hardly ever be re-let at the same rates as the former occupants paid. Any evidence, therefore, which rates of rent may have afforded of the quality of the soil in 1865 must have been lost trace of before proceedings were adopted to effect the settlement of 1878, which was contemporaneous with the assumption by Government of the direct management of these estates. The same remarks are understood to be applicable to the estates of neighbouring zemindars. In them, as in the Government estates, there could really be said to be no rates of rent at all. And when the zemindars were called upon by the Settlement Deputy Collector to furnish him with the rates in adjacent villages, I am informed that they merely stated what, according to the existing rental, would fairly represent rates.

Effect of the settlement of 1878 on Rates of Rent.

5. At the settlement of the Jaypur estates in 1878, rates of rent themselves entirely vanished. Each ryot settled separately for a lump sum for his whole holding, stipulating at the same time that there was to be no subsequent re-measurement during the period of settlement, which was fixed for 15 years, and does not therefore expire until March 1893. The Deputy Collector commenced proceedings in 1874, and measured and classified all the plots in each holding. In classifying individual plots, he relied mainly on the farmer's records; but in many cases, as can readily be understood from what has been said above, he found that land was entered as being of a lower quality than it really seemed to him to be. Thus he corrected to the best of his judgment, without taking any steps to ascertain the productive capabilities of the lands whose classification he changed. Adopting the rates fixed in 1865, he found that these alterations produced an increase on the rental collected by the farmer of Rs. 3,621, or 10.5 per cent. He also found that the area under cultivation was 37 per cent. greater than it was when the farmer made his last settlement in 1865. This increase was represented by an addition of Rs. 9,787, or 28.5 per cent. to the rental. The farmer's rental was Rs. 34,253-9-6, of which he left unlevied on account of *kazat* Rs. 3,108-1-9, and the rental ultimately fixed by the Deputy Collector at the farmer's rates amounted to Rs. 47,665. Although the ryots found that the rates fixed so far back as in 1865 were not to be changed, they nevertheless objected to the proposed settlement. They declined to agree to any rates whatever, and disputed the correctness of the Deputy Collector's classification. They admitted, however, that their cultivation had increased perhaps to the extent disclosed by the measurements, and in view of this they were willing to pay some increase on their former rental. Each agreed to pay a lump sum for his whole holding on condition that no re-measurement or revision should take place for 15 years; and on this basis, and this alone, the settlement was finally concluded by Mr. Vensey, the then Covenanted Deputy Collector of Bagra, and by the manager of the khas mehals, and sanctioned by the Board and by Government. The rent ultimately agreed to was Rs. 39,499, but this included Rs. 100 for *adl* dues, and Rs. 251 for fisheries, so that the rental for cultivated land was really Rs. 38,848,—an increase of about 25 per cent. on the rental (excluding *kazat*) the farmer used actually to collect. Under the circumstances which led to a settlement, in which the ryots practically dictated their own terms, this increase in rental may be considered as entirely due to the increase of 37 per cent. in the area under

cultivation. Naturally the addition to the rental would not be proportional to the increase in the cultivation, as the latter area would yield a lower average rate of rent than the previous area under crops.

Reasons for abandoning any attempt to apply rates of rent at the Settlement of 1878.

6. Although the rental at which the settlement was concluded was 17 per cent below that fixed by the Deputy Collector at the rates of 1865, it is doubtful whether, under the circumstances, any better result could have been obtained than was effected by the compromise which was agreed to. The position was summed up by the Commissioner in his letter No. 2123et. of the 10th March 1879, to the Board of Revenue, and I cannot do better than quote a portion of his remarks, as they are in entire accordance with all the information I have been able to ascertain. In that letter the Commissioner invited special attention to the fact "that, owing to there being more land than ryots in the part of the district in which the Jaypur estates are situated, and to zemindars compelling to a certain extent for ryots, the latter are almost masters of the situation; and if we do not come to an agreement with them as to enhancement, it is probable that we may not only get none at all, but in the course of a year or two, by attempting to enhance the rents in a perfectly legal manner, and to a most reasonable extent, cause desertion of the ryots for neighbouring estates, the owners of which are more willing to meet the ryots half way, and thus actually reduce our rent-roll, which would be a very unsatisfactory result, at the expenditure of a considerable sum of money in measurement operations. There is another point, too, to which special attention is necessary, namely, that owing to this strong position of the ryots they do not now really pay rent at any rates at all. The estates have been, until lately, let in farm, and it has been the custom to make a deduction of about 10 per cent. from the amount nominally payable by the ryots on account of what was called *kurat*, which was only paid in extraordinarily good seasons, and very rarely in full even then. Again, the ryots have held, with the farmer's full knowledge, more land than they paid rent for. Not only will the rates, if it is attempted to apply any, be found different in neighbouring village in the estates, but in adjoining holdings in the same village, and in fact for some years past, it would appear that within certain limits the amounts paid have really varied in a great measure according to the strength of the ryot's character and influence over others."

History of the Jaypur Government estates.

7. Whether owing to their general unhealthiness, as is usually supposed, or to some other reason, the population of these mohals, and with it the area under cultivation, appear to have always been comparatively small and to have been subject to considerable fluctuations. The estates became the property of Government a little less than half a century ago, simply because their proprietors were unable to meet their engagements. They are seven in number, and were purchased by Government at sales for arrears of revenue on the following dates:—

1. Lot Chhawalpura	March 1836.
2. Kishanmat Saguna	November 1836.
3. Hudda Purnaspall	February 1836.
4. Hudda Baguri	December 1831
5. Hudda Balighata	August 1828
6. Devkhanda	19th April 1837
7. Dharanji	6th April 1837.

In 1837 and 1838 these estates were let in farm to Mr. Payter, with the exception of Dharanji, for which another farmer agreed in 1839 to pay a *jama* of Rs. 609.9 with a yearly increase of Rs. 10. As he failed, however, to meet his engagements, the farm of that estate was taken from him in 1841 and given to Mr. Payter at a reduced *jama* of Rs. 481.11.2½. It is instructive to note how the *jama* of these estates fluctuated with different farming leases. I have been unable to obtain this information with respect to Kishanmat Saguna and Devkhanda; but the following table will show the farming *jama* for the rest at different periods, of which I have obtained a record:—

NAME OF ESTATE	Former Government revenue	1836.	1841.	1847.	1851.	1853.	1859.	1873.	1874.	1878 estimate (by party Collector's rental.	1878 estimate (by party Collector's rental.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Chhawalpura	10,245	7,800	7,500	8,011	—	—	—	8,122	15,381	21,507	25,000
Kishanmat Saguna	—	—	—	—	—	—	—	1,044	—	2,427	8,730
Purnaspall	—	2,500	2,500	2,200	2,200	2,225	2,222	2,222	2,630	3,187	5,570
Baguri	—	1,000	1,000	1,000	1,000	1,010	1,010	1,010	1,365	2,113	2,681
Balighata	—	1,000	1,000	1,000	1,000	1,018	1,018	1,018	1,216	1,704	1,177
Dharanji	609	809	831	831	861	861	681	667	583	1,114	811
Devkhanda	—	—	—	—	—	—	—	—	—	1,153	—

The fluctuations in the *jamas* of lot Chhawalpura, Balighata, and Dharanji are particularly instructive in indicating what changes in the area under cultivation must have taken place. Mr. Payter did much for the improvement of the estates by introducing Bums and others from Chutia Nagpur. The indigenous population are averse to hard labour of every kind, but these Bums are said to be capital hands at clearing jungle lands, which they get

from Mr. Payter on specially favourable terms, often with the addition of advances by way of supplying them with some capital. Still as much as 37 per cent. of the total area of the mehals is at present uncultivated, and of this only one-fourth is unculturable. The following table shows the cultivated and uncultivated area in each estate:—

NAME OF ESTATE.	Cultivated area in acres.	Uncultivated area in acres.	Total area in acres.	Present Government rental.
				Rs.
Lot Chhawalpara	12,295	6,011	18,306	25,900
Kishamat Saguna	4,834	2,035	7,773	6,229
Hudda Purnampail	1,580	588	2,168	3,629
Hudda Nagar	613	705	1,318	1,681
Hudda Bahghata	498	735	1,233	1,187
Dharamji	411	151	562	871
Lot Devkhanda	557	888	1,445	813
TOTAL	20,833	13,013	33,845 [=51 sq. miles]	39,109

In Kishamat Saguna, Government only possesses a joint share with other proprietors and this varies in different villages. In the total rental is included Rs. 100 for *hats*, and Rs. 251 for fisheries. At the last census the population of the mehals was returned as 19,694, or the average of 386 to the square mile. I do not know whether the necessary adjustments were made in the draft schedules from which these figures have been taken: judging from the state of the country, I should hardly have thought that the population was as much as nearly 400 to the square mile. Taking five as the ordinary size of a family, we get as the average size of each holding $5\frac{1}{2}$ acres or 11 local bighas. The number of tenants on the estates is, however, 5,115, which reduces the average size of a holding to a little over 4 acres or 8½ local bighas. A local bigha is equivalent to $\frac{1}{4}$ or a little over half of an acre.

Reasons why no adjustment between Rent rates and Soil classification can be preserved in this tract of Country.

8. In view of the figures given above, it is not to be wondered at that there is competition rather on the part of zemindars for ryots than on the part of ryots for land, and that the latter frequently relinquish their holdings in the hope of securing better terms elsewhere. For the useful Bhumis especially there is considerable competition on the part of neighbouring zemindars, and the promise of being allowed to hold any land they clear rent-free for, say, ten years, is generally sufficient to induce them to take up new land. I am informed that the promise on which they are induced to clear land in other zemindari is occasionally broken, and in that case they readily migrate elsewhere, leaving the land they have cleared to be occupied by ryots who are willing to pay the zemindar a fair rent for it. But the indigenous population are quite as migratory in their habits, and they have but little affection for their homesteads, for it is the general custom to relinquish the whole holding at a time. They almost invariably succeed in obtaining good land on more favourable terms than their old holding. I observe from Mr. H. R. Reilly's report No. 268 of the 15th October last, a copy of which has been forwarded to me by the Board, that in the Chanchal estates in Maldah also "land was too plentiful and the zemindars were only too anxious to entice away the tenants of their neighbours, to permit the screw being applied too severely;" but their tendency to relinquish their *jabs* and become *paikash* tenants on neighbouring estates was restrained somewhat by the advantage their landlord was able to take of their affection for their homestead lands to raise arbitrarily the rates for these. In the western portion of the Bogra district the ryots do not appear to have any such affection for their homesteads as the Chanchal ryots have, and they frequently move from one village or estate to another. The following figures will shew what changes of this nature have occurred in the Jaypur estates during the three years that have elapsed since the last settlement was concluded:—

YEAR.	LAND RELINQUISHED OR ABANDONED.		RELINQUISHED LAND RE-LET TO				CHANGED AND UNCHANGED WASTE LAND TAKEN UP BY			
	Number of ryots.	Area in local bighas.	Resident ryots.		Paikash ryots.		Resident ryots.		Paikash ryots.	
			Number of ryots.	Area.	Number of ryots.	Area.	Number of ryots.	Area.	Number of ryots.	Area.
1879-80	170	1,383	—	403	64	328	176	477	74	390
1880-81	120	815	23	122	0	66	176	401	80	—
1881-82	100	1,801	150	661	21	66	160	480	45	348
TOTAL	430	3,999	360	1,227	71	460	511	1,358	199	838

These figures are very instructive. They show that nearly 10 per cent. of the holdings have been vacated during these three years, and that no less than 1,320 local bigahs, or 622 acres of land, which was cultivated three years ago, have gone out of cultivation. The excess 615 bigahs of new land taken up over and above the quantity of land which has gone out of cultivation has, however, prevented the total rental from being reduced in the interval by more than Rs. 48; but the results vary considerably in different villages and from year to year. Under such circumstances, it is pretty clear why the ryots are "masters of the situation," and can practically dictate their own terms.

Diversity of rates in the Jaipur Estates.

9. That rents have hitherto been determined in this part of the country by competition, may be gathered from the great diversity observable in the rates of rent for different villages which were ascertained by the Settlement Deputy Collector. As has been already explained in paragraph 4 of this report, there were really no rates of rent at all based on soil classification; but the Deputy Collector ascertained what were understood to represent rates of rent in each village in the Government estates and in the vicinity, although the full rates were seldom actually levied. These rates disclose far greater diversity between village and village than could possibly be due to difference in soil and situation, and can only be explained on the understanding that they have been determined solely by competition. I subjoin a list of the rates found by the Settlement Deputy Collector in the Government villages, and those adjacent to them in two tracts of country—one the northern, and the other the south-eastern portion of the mehals. I have selected these tracts because in them villages belonging to other proprietors are found adjacent to the Government villages. The south-eastern portion is the best populated and cultivated tract in the mehals, and pays the highest rates of rent. The villages belonging to Government are underlined in the two tables, and the rates for them are those fixed by the farmer in 1865, and were considered by the Deputy Collector to be fair and equitable, although he gives no information from which his reasons for coming to this conclusion can be gathered:—

TABLE I.
Northern portion of Mehals.

NAMES OF VILLAGES.	Best.	First Quality	Second Quality.	Third Quality	Fourth Quality.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Kalyanpur	2 0 0	1 4 0	1 0 0	0 12 0	...
Chak Prayag	0 15 7	0 15 7	0 15 7	0 15 7	0 15 7
Ramkulapur	2 0 0	1 12 0	1 4 0	0 14 0	0 10 0
Durgapur	2 4 0	1 8 0	1 0 0	0 8 0	0 4 0
Kanva	2 0 0	1 4 0	0 12 0	0 8 0	0 4 0
Almagar	1 0 0	0 9 0	0 6 0	0 8 0	0 4 0
Bahyatour, I	2 0 0	1 4 0	0 12 0	0 8 0	0 6 0
Bahyatour, II	2 0 0	1 8 0	1 0 0	1 0 0	1 0 0
Rabunapur	2 0 0	1 4 0	1 0 0	0 12 0	0 6 0
Bara Dhawagir	2 0 0	1 8 0	1 0 0	1 0 0	1 0 0
Jaydubpore	2 0 0	1 4 0	1 0 0	0 12 0	0 8 0
Phutan	2 0 0	1 8 0	1 0 0	1 0 0	1 0 0
Asbarya	4 0 0	3 0 0	2 8 0	2 0 0	1 8 0
Srimukh	2 0 0	1 4 0	1 0 0	...	...
Ramnagar	2 0 0	1 8 0	1 0 0	1 0 0	...
Darpoil	2 0 0	1 8 0	1 4 0	1 0 0	0 12 0
Anantapur	4 0 0	3 0 0	2 8 0	2 0 0	1 8 0
Damudarpur, I	..	1 8 0	1 4 0	1 0 0	0 12 0
Damudarpur, II	3 0 0	3 0 0	2 8 0	2 0 0	0 12 0
Kristapur	3 0 0	1 12 0	1 8 0	..	..

NAMES OF VILLAGES.	Basta	First Quality	Second Quality	Third Quality	Fourth Quality
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Madal or Chota Manika I	1 0 0 2 0 0	3 0 0 1 8 0	2 8 0 1 4 0	2 0 0 0 12 0	
Chota Manika, II	1 0 0	1 0 0	2 8 0	2 0 0	1 12 0
Dandua	3 0 0	3 0 0	2 8 0	2 0 0	1 12 0
Malucha	5 0 0	2 0 0	1 0 0	0 12 0	0 4 0
Kesubpur	2 0 0	1 8 0	1 4 0	1 0 0	0 8 0
Tighda	1 0 0	1 0 0	2 8 0	2 0 0	1 12 0
Tatulpur	2 0 0	1 8 0	1 4 0		
Dhawagar	2 0 0	1 8 0	1 0 0	1 0 0	1 0 0
Patan	2 0 0	1 8 0	1 0 0	0 12 0	0 8 0
Shamsabad	2 0 0	1 8 0	1 4 0	1 0 0	0 10 0

TABLE II
South-eastern portion of Mehals

NAMES OF VILLAGES	Basta	First Quality	Second Quality	Third Quality	Fourth Quality
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Gabarpur	2 0 0	1 5 0	1 4 0	1 0 0	0 12 0
Kanupore	1 0 0	2 8 0	2 0 0	1 5 0	1 0 0
Parbat	2 0 0	1 12 0	1 8 0		1 0 0
Chak Gobinda	5 0 0	4 0 0	2 8 0	2 0 0	
Munad		1 10 0	1 4 0	0 10 0	
Sinnarpur		1 12 0	1 0 0	1 0 0	0 12 0
Gandharbypur	4 0 0	2 0 0	1 8 0	1 0 0	
Syampur	2 0 0	2 0 0	2 0 0	2 0 0	2 0 0
Chak Nizam	2 0 0	1 8 0	1 4 0	1 2 0	
Shalbou	2 0 0	1 12 0	1 8 0	1 4 0	
Kanahat	1 8 0	1 8 0	1 8 0	1 8 0	
Nemaj	2 0 0	0 12 0	1 4 0	0 12 0	0 8 0
Kalichit	2 0 0	1 12 0	1 8 0	1 4 0	1 0 0
Chapadal	2 0 0	1 8 0	1 4 0	...	..
Malapur	2 0 0	1 8 0	1 4 0	0 12 0	0 8 0
Gangaprasad, I	2 0 0	1 8 0	1 4 0	0 12 0	
Gangaprasad, II	3 0 0	2 0 0	1 8 0	1 0 0	
Rokundipur	2 0 0	1 10 0	1 6 0	1 0 0	0 12 0
Jamalpur	4 0 0	2 0 0	1 8 0	1 0 0	0 12 0
Chak Jagutsing	2 0 0	1 12 0	1 4 0	0 12 0	0 8 0
Baring	1 7 0	1 7 0	1 7 0	1 7 0	1 7 0
Datra	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0
Amulhab	5 0 0	3 0 0	2 0 0	2 0 0	2 0 0
Chanda	2 4 0	2 0 0	1 10 0	1 8 0	1 4 0

The rates are the same for low land as for upland. In the case of some of the villages of private proprietors in the second tracts, the rates appear very high compared with those in the Government villages. These, however, the ryots pay willingly enough, as they have generally extended their holdings considerably beyond the quantity of land for which they pay rent: and if the rates pressed upon them in the least, I am informed that they would have no hesitation in relinquishing their holdings.

Calculation of what may be assumed to represent existing Rates of Rent.

10. The diversity disclosed by these rates is due to the varying demand for land in each village, and the comparative strength of the ryot's position. The effect of the last settlement in 1878, on the basis of terms dictated by the ryots, was to intensify this diversity. Although at that settlement rates were entirely swept away in Government villages, I have been able to calculate for each village on the basis of the farmers' rates fixed in 1865 and accepted by the Deputy Collector what we may assume to represent the rates now actually paid. The settlement records show the quantity and quality of cultivated land in each holding, and its gross rental as the rates accepted by the Deputy Collector. We may take for granted that the ratio between these rates was admitted by the ryots to be fair; and although they disputed the correctness of his classification of their lands, we may assume that what he gives as the quantity of the land of each quality in the village is a pretty near approximation to the truth—at any rate, it is as near an approximation as we can get. On these assumptions, I have been able to calculate for each village in the mehals what effect the difference between the gross rental ultimately agreed to by the ryots and that fixed by the Deputy Collector has made upon the rates accepted by him. This has been a laborious process, and my establishment has found great difficulty in obtaining the necessary data in the case of the 53 villages in estate Kishanmat Saguna, as, besides holding a varying *izmat* share in each of these villages, the Government is full proprietor of numerous specific and ill-defined areas of land in them. But for these difficulties, I should have been able to submit this report on a much earlier date. In view, however, of the basis from which the present enquiries have to start, I deemed it necessary to make this attempt to get at existing rates of rent. I subjoin a table showing the *maxima* and *minima* rates of rent ascertained in this way, excluding, however, the abnormal case of the large village of Pahananda, in which there is so much waste land that the cultivated area pays a uniform rate of only 1 anna 1 pie per standard bigha:—

DESCRIPTION OF LAND.	RATES PER LOCAL BIGHA.		RATES PER STANDARD BIGHA.		RATES PER ACRE.	
	Minima.	Maxima.	Minima.	Maxima.	Minima.	Maxima.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Basta	0 11 0	2 13 8	0 7 1½	2 1 7	1 7 1	6 6 7
First quality	0 5 1½	2 6 2½	0 3 0	1 13 4	0 10 9½	5 8 9
Second ditto	0 4 0	2 0 0	0 2 5½	1 0 2	0 8 5	4 12 1
Third ditto	0 3 2½	1 13 0	0 2 2½	1 4 3	0 6 9½	3 13 3½
Fourth ditto	0 2 1½	1 8 2	0 1 5½	1 0 11	5 4 5½	3 2 7½

The highest rates are found in the village of Srirampur and Chanda, in the south-eastern and best populated portion of the mehals, the uncultivated culturable land in the former amounting to only 4·3 per cent. of the area, and the latter to only 3·7 per cent. That even these, the maxima rates, do not press upon the cultivators, is shown by the circumstance that the gross rental which they voluntarily agreed to pay is in Srirampur 36 per cent. and in Chanda 19 per cent. above what the Deputy Collector fixed it at. The average rates fixed by him for the Government villages enumerated in the second table given in last paragraph are only Rs. 2-0-7, Re. 1-10-7, Re. 1-5-7, Re. 1-0-0, and Re. 0-12-7 per local bigha for the different qualities of soil; and the rents *ultimately* agreed to for the same villages give an average of only Re. 1-12-1, Re. 1-9-1, Re. 1-4-5, Re. 0-15-7, and Re. 0-11-1 per local bigha. These latter rates may be taken, therefore, as the prevailing rates in the most highly assessed portion of the mehals; they are equivalent to Rs. 1-5-7½, Re. 1-3-3½, Re. 0-15-8½, Re. 0-12-0, and Re. 0-8-6½ per standard bigha respectively, or Rs. 4-1-4, Rs. 3-10-7, Rs. 2-15-7, Rs. 2-4-4, and Re. 1-9-11 per acre. Taking in a similar manner 21 Government villages in the north central portion of the mehals, in which the rates appear on the whole to be the lowest, I find that the average rates ultimately agreed to were:—

	Per local bigha.	Per standard bigha.	Per acre.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
Basta	1 4 10	0 12 3	2 5 1
First quality	6 13 3	0 8 2	1 3 8½
Second ditto	0 10 8	0 6 6½	1 3 9
Third ditto	0 8 10	0 5 5	1 0 4½
Fourth ditto	0 6 3	0 3 10	0 11 7

The mean of these two averages for the areas of highest and lowest assessment gives the fairest average for the whole mehals, although the rates for the two lowest qualities strike me as being rather higher than the real average. An arithmetical mean between the maxima and minima rates would be entirely misleading, as the great majority have rates tending rather towards the minima than towards the maxima. The mean rates for the whole estates are thus found to be:—

DESCRIPTION OF LAND	Rates per local bigah.	Rates per standard bigah.	Rates per acre.
	Rs A P.	Rs A P.	Rs A. P.
Bastu	1 8 5½	1 0 11½	3 3 2½
First quality	1 3 2	0 12 9	2 9 7½
Second ditto	0 15 6½	0 11 1½	2 1 8
Third ditto	0 12 2½	0 8 8½	1 10 4½
Fourth ditto	0 8 8	0 6 2½	1 2 9

This gives an average rate per local bigah of one rupee, which is just about the result which the total rental of the estates gives after deducting *lakhuay* and *istimurare jotes*.

Average value of the gross produce.

11. I now proceed to calculate what proportion these rates bear to the gross value of the produce. As has been already remarked, rice is the preponderating crop in these estates, *aman dhan* being grown on 45 and *aus dhan* on 14 per cent. of the cultivated area, and as no distinction appears to be made in this part of the country between upland and lowland for the purposes of assessment, we may fairly refer rates of rent, such as they are, to the productive capability of rice land alone. Unfortunately, owing to a failure of the rice crop this year in the western portion of the Bogra district, I have been unable to test, by experimental enquiries, the average outturn of rice on each quality of soil. It is estimated that, owing to want of rain, *aman dhan* has this year been grown only on about 25 per cent. of the area usually grown with that crop; and where it has been possible to produce a crop, the outturn must be very much less than it would be in ordinary years on the same land, except on lands where the crop is usually destroyed by inundation. How much less it probably is, it is extremely difficult to estimate; there is no criterion by which we can arrive at a conclusion, and it will be less in some villages than in others. On the other hand, where there is what has been described in paragraph 3, as the lower sort of rice land on which the crop is usually destroyed by inundations, the outturn has been better than on the very best land, and that too in inverse proportion to the quality of the soil. In most of the villages in the mehals there is some land of this kind, and in the southern portion there is hardly a village in which rice has this year been grown except on this lower sort of land. In all but one or two villages in the whole estates it was impossible to find a crop on more than two qualities of soil, and in two out of the four villages where I found rice on three qualities, I had for the purposes of experiment to cut two out of three specimens of the third quality out of one and the same plot. The result of the few experiments I was able to make was that in villages with *kasyar* (clayey) soil, the outturn of clean rice averaged 4 maunds 11 seers and 12 chittaks, and on *pasi* (alluvial) soils of the higher sort 9 maunds and 35 seers per acre. These results show a very poor harvest, even although the experiments were made in villages with the best crop, for the best information I can obtain leads me to conclude that the average outturn of clean rice in ordinarily good years is at least 15 maunds. Judging as best as I can, I should say that the outturn this year on lower third quality land is somewhat less than that on first quality land in an ordinarily good year; that on lower second quality land somewhere between this and on higher second quality land; and that on first quality and higher second quality land about half and three-eighths of an ordinarily good outturn. But there is no certainty about this, and the estimate would not be the same for all villages. The year is an exceptional one, and the general impression seems to be that it is not much better than the famine year 1874. Even if the Rent Bill were already law, I do not think it would be possible to frame rates of rent in a year like this, or at any rate to test what proportion existing rents in each village bore to the average value of the gross produce. After having been over all the *dhan* villages in the mehals, I have been obliged to give up the attempt to ascertain, by actual experiment, the outturn of rice on the various qualities of soil, and to obtain some idea of the average produce. I have been compelled to rely on what information I have been able to gather from the most intelligent residents on the Government estates and in the neighbourhood. It is, however, very difficult to get reliable information on these points hereabouts, as almost all the *aman dhan* is usually required for local consumption, and few people have any occasion therefore to be acquainted with the bigah produce of their fields. Taking the estimate, however, in which

most of those who were able to give me any agreed, I find the average produce of *aman dhan* in ordinarily good years to be:—

QUALITY OF LAND.	OUTTURN OF PADDY.			OUTTURN OF CLEAN RICE.		
	Per local bigah.	Per standard bigah.	Per acre.	Per local bigah.	Per standard bigah.	Per acre.
	Mds. S. C.	Mds. S. C.	Mds. S. C.	Mds. S. C.	Mds. S. C.	Mds. S. C.
First quality	15 0 0	10 10 6	31 28 10	10 20 0	7 13 9	22 8 2
Second ditto	11 10 0	7 34 8	23 31 9	7 35 0	5 20 3	16 26 2
Third ditto	7 20 0	5 9 11	15 34 6	5 10 0	3 26 12	11 4 1
Fourth ditto	5 0 0	4 7 12	12 27 8	4 8 0	2 37 7	8 35 4
Average	9 37 6	6 37 13	21 0 8	6 38 4	4 34 8	14 28 6

The average outturn of 14½ maunds of clean rice per acre is probably somewhat under the mark, as in ordinarily good years more rice land of the first and second qualities taken together is cultivated than of the third and fourth. I have taken the outturn of clean rice as $\frac{2}{3}$ the that of paddy, as this appears to be the proportion established for *aman dhan* by the experiments reported in the *Statistical Reporter*, volume I, page 290. The general result is about the same as that taken by Mr. MacDonnell as a fair average outturn from an acre of single-crop rice land in an ordinarily good year in the adjoining district of Rungpore, namely, 15 maunds (vide "Report on the food-grain supply of Bengal and Behar," page 233). This we may take as the average outturn. I find that the price of rice varies considerably at the different local hâts. The average price for the last five years during the months in which the ryots ordinarily sell their rice is Re. 1-5 per standard maund, and this, I understand, is a fair average general price. For three years following the famine the price was unusually high; but last year and the year before the price was very low, only Re. 1-4-6 and Re. 0-15-3 per maund respectively. Notwithstanding the facilities for export afforded by the railway, prices have declined during the last five years. That they have not been increasing is not wonderful, considering how little of the *aman dhan* grown in these mehals is available for export. Taking the daily consumption at $\frac{2}{3}$ lbs of a seer per head of the population as a rather liberal allowance, I estimate the quantity of rice required for local consumption at 1,31,700 maunds per annum. The area in *aman dhan* is about 9,400 acres, so that the annual outturn will be about 1,41,000 maunds, of which about 9,100 would be required for seed and will not have been husked. What is required for seed and for local consumption would absorb the outturn of *aman dhan*, but a portion of the local consumption of rice is supplied by *aus dhan*, and no doubt some *aman dhan* is exported.

Percentage which the supposed existing rates of rent bear to the value of the gross produce.

12. On the whole, we may take Rs. 1-9 as fair average price of rice, and at this price the following table shows what percentage of the gross value of the produce are:—(1) the maxima rates discoverable anywhere in the mehals; (2) the average rates in the tract most highly assessed; (3) the average rates in the tract where the assessment is lightest, and (4) the maxima rates. These rates have already been given in paragraph 10:—

DESCRIPTION OF LAND.	Average outturn of clean rice per local bigah.	Value of produce.	PERCENTAGE OF GROSS VALUE OF PRODUCE OF—			
			Maxima rates.	Average higher rates.	Average lower rates.	Minima rates.
	Md. s. c.	Rs. a. p.				
First quality	10 20 0	16 8 6	14 5	10 3	5 1	1 9
Second "	7 35 0	12 5 0	16 6	10 9	5 4	2 0
Third "	5 10 0	8 3 3	22 1	12 2	6 5	2 3
Fourth "	4 8 0	6 0 0	23 0	13 0	5 9	2 0
Average	6 38 4	10 14 0	19 0	11 3	5 7	2 0

At the unusually low price of 15 annas 3 pies per maund, the percentage of rates to the gross value of the produce was for the various qualities of soil in the area of highest assessment 15-7, 17, 19-4 and 17-3 and in that of lowest assessment 8-3, 8-9, 11, and 9-7. The rates, therefore, are moderate, and it must be borne in mind that virtually it is the ryots themselves who fixed them.

Material condition of the peasantry.

13. As might be expected, the ryots in this part of the Bogra district, and particularly in the Government estates, are substantially well off. They appear to be a contented lot, and

they can afford to be very independent. A comparison of the average income and expenditure of an ordinary cultivator will furnish another test of the moderateness of the assessment for this purpose. I shall take the usual case of a family consisting of the cultivator, his wife and three children, the latter all under the age at which they would be able to assist their father in the labour of the fields, and so enable him to extend his cultivation in proportion to the subsistence required for his family. On a very liberal estimate the daily consumption of rice of such a family would be—

	Seer
For the two adults	12
For the three children	12
Extra	3
Total	4

The annual consumption of rice would therefore be $36\frac{1}{2}$ mounds. The cultivator would be able, unassisted, to till 11 beegahs of land, on which he would probably grow *aman* and of $1\frac{1}{2}$ *aman dhan*. The outturn in clean rice would be about 5 mounds of *aman* and 10 of *aus*. About three mounds would be set aside for seed and for provision for wastage, so that there would be surplus of about $5\frac{1}{2}$ mounds after providing for subsistence, and it must be remembered that a liberal allowance has been made for that on one beegha of his holding the cultivator would grow *kesari* and *masuri*, but only sufficient for his own consumption. Half a beegha he would devote to the cultivation of chilis, potatoes &c., with the sale-proceeds of which, after providing what he needs for his own consumption, he would be able to pay for all the salt, oil, fish, and other articles of food he might require. The whole of the produce of the rest of his land he can therefore afford to sell. This will usually be two beegahs of mustard (*sharada*), half a beegha of mte, and half a beegha of sugarcane. The net value of the produce of these crops, after deducting all expenses for their cultivation and bringing them to market, would be—

	R	a	p
Mustard	10	0	0
Mte	6	0	0
Cane	12	8	0
Total	28	8	0

Adding to this Rs. 7-10 as the value of the $5\frac{1}{2}$ mounds of rice he has over for sale, he will have over Rs. 36 with which to meet all his other expenses. His rent at the average rate in these mchals will be Rs. 11 and his chowkati tax Rs. 1. He own and his wife's clothing may cost him Rs. 6 and his children's Rs. 2. All his other necessary expenses such as the cost of purchasing agricultural implements and domestic utensils, and of getting his house repaired, will not amount to more than Rs. 6. Most ryots have two or three cows, from which they breed their own plough-cattle. There is no expense involved in maintaining any number of cattle the ryot may care to keep, good pasturage is abundant, and the *dhan* stubble is also used as food. What labour is required, except for the preparation of *aur* (and this has been already taken into account), has not to be paid for, as the villagers help each other in turns. At the outside, therefore, the cultivator's annual expenses cannot exceed Rs. 26, and to meet this he has an income of at least Rs. 36, leaving him with a surplus of Rs. 10. The estimate of expenditure is purposely a liberal one, and as most ryots have some one in their family who can keep them to cultivate a considerably larger holding than that which I have assumed, we may conclude that a ryot is generally a good deal better off than this estimate would make him out to be.

Impracticability of applying Rates of Rent in the present condition of the Country

14. In every view of the circumstances, therefore, it seems to me that competition cannot yet have forced up rents in the Jaypur estates to the point at which it would be possible to apply the principles of the Rent Bill in order to secure them being fair to the ryots. To revise them in favour of the landlord, so as to make them fair and equitable to both parties, may be abstractly possible in accordance with the principles of the Rent Bill, but the application of the rates in practice would be difficult, and any adjustment which it may have been possible to effect between rent rates and soil classification would soon be disturbed by the interest zemindars would have in endeavouring to meet their ryots half way. Uniformity in rates would soon disappear according to the quantity of uncultivated land available, and the strength of the ryots' position. Even if the present settlement were about to expire, I do not think that since rents were last fixed in 1878, there has been any increase in the productive powers of the soil or in the value of its produce which would justify any general enhancement of rates. As to the first ground of enhancement specified in section 22 of the Bill, I can only remark that no such thing as a prevailing rate is discoverable, and the second ground of enhancement does not properly affect rates at all.

Further enquiries.

15. The remarks which I have made apply to the whole area of the Jaypur Government estates. I have been directed, however, in the Board's letter No. 47A, dated the

11th instant, to limit my enquiry, so far as these estates are concerned, to the northern portion, and with the permission of the proprietors to extend my enquiries to a number of villages belonging to some neighbouring estates in this part of the district. So far as I am aware, these other villages are in precisely the same condition as the Jaypur estates, and in view of the remarks I have made, the Board may perhaps think it unnecessary for me to analyse their jamabaudis in the somewhat elaborate manner in which I have had those of the khas mehals analysed. What are called the rates may perhaps be easily enough ascertained. Those for contiguous villages are contained in the proceedings of the Settlement Deputy Collector, and I have already remarked that, where these rates may appear somewhat high in comparison with our rates, the ryots are willing enough to pay them, because, by consenting to do so, they are probably able to extend their cultivation as they please without being subjected to frequent re-measurements. The Board may perhaps be disposed to deem it unnecessary for me to subject the jamabaudis to more than a somewhat cursory examination, unless I may happen to discover a state of things substantially different from that prevailing in the Government estates. Should the Board be of opinion that I might profitably proceed to ascertain by experiments on the different crops as they become ripe for gathering, what is the average outturn on the various classes of soil in each village, I should be obliged by being favoured with instructions for prosecuting such enquiries. Without instructions for my guidance, of a more or less precise nature, I must be apt to be myself in that "maze of isolated facts" which the Government of Bengal anticipates as the probable results of desultory enquiries conducted in the absence of some such definite basis as existing rates of rent to serve as evidence of soil classification. The instructions issued for the conduct of settlement operations in the North-West Provinces, which I have not seen, might perhaps be useful to me in such enquiries. I presume, however, that the only object which would be furthered by making these investigations would be to discover what practical difficulties might be in the way of ascertaining how far uniform rates of rent might be framed for a considerable area *in the absence of existing rates based on soil classification*. Such enquiries would possess only an experimental character, even if they were to lead to the framing of uniform rates of rent. The time has not, in any opinion, come at which it would be practicable to apply these rates in this undeveloped tract of country. With reference to Baboo Parbatty Charan Roy's scheme for determining rent rates, I may here observe that I do not think it could be practically applied in this part of the country. Its character is too diversified to enable us to predicate any such uniformity in the quality of the soil of a particular area, as appears to be indispensable to the successful application of his system.

Summary.

16. I may close this report, which has extended to a greater length than I had hoped it would, by summing up the results of my enquiries so far as they have already gone.

I.

There is in the Jaypur Government estates and in the neighbourhood, recognised classification of the soil into two main classes—upland and lowland; and each of these is sub-divided into at most four qualities; but neither for assessment nor for any other purposes is any distinction drawn between the natural productive capabilities of the two main classes. This classification is not, however, understood by the mass of the peasantry, who speak of their lands simply as good, bad, and indifferent, and that too without distinguishing between their natural fertility and the increase in their productive powers conferred upon them through their own agency. Similarity of nomenclature does not import identity of quality in the soil of different villages, as the best land in each village after homestead land, whatever its real capabilities, is designated "first class," and the other qualities are referred to as a standard.

II.

In 1865 Mr. Payter, who farmed the Jaypur Government estates, drew up rates of rent for the different classes of soil in the holdings of such ryots as were already settled down in each village. These rates differed from village to village, not according to any real difference in the quality of the soil, but according to the abundance of waste land available for cultivation, and the strength of the position the ryots were able to take up. The custom, moreover, prevailed then and still prevails hereabouts, by which ryots relinquish their holdings generally every fourth or fifth year in the expectation, almost invariably realized, of being able to secure better terms elsewhere, and such lands could seldom be re-let at the old terms, and often went out of cultivation altogether. Besides this disturbing influence, a great quantity of new land has been taken into cultivation since that date, and let out at no rates whatever beyond an arithmetical average, which ignored the qualities each separate lot might comprise. Any connection, therefore, which may have once subsisted between rent-rates and soil classification has long ago disappeared in these mehals, and the same may probably be said of all surrounding estates. Any readjustments, moreover, of the rates to the classes of soil would, in the present undeveloped state of these estates, be again similarly overridden by the operation of what is really the principle of competition, as the law does not profess to interfere with any contract arrangements which may be prompted by a zamindar's desire to promote his own interests by accepting terms practically dictated by, and therefore necessarily fair to, his ryots.

III.

At the settlement of 1878, when the Government brought the Jaypur estates under direct management, rates of rent themselves vanished, and each ryot virtually dictated his own terms, and settled for a lump sum for his whole holding, which was not to be subject to revision for 15 years. On this basis, and this alone, the existing settlement was concluded.

IV.

Owing to the abundance of new land available for cultivation, and to there being competition rather on the part of zamindars for ryots than on that of ryots for land, the latter are still masters of the situation, and can for some time yet secure favourable terms from the proprietors of land. Under such circumstances, any attempt which might be made at present to stereotype rates of rent based on soil classification would probably fail. Rents may therefore be left in the meantime to be governed by the principle of competition, and when the proper time comes, there will not be wanting indications by which the executive officers of Government can ascertain whether it would be both desirable and practicable to bring them within the enhancement clauses of the Rent Law in the interest alike of the zamindar and of the ryot.

V.

Even if it were at present desirable in these and other estates in the western portion of the Bogra district to frame rates of rent based on soil classification which would be fair alike to the zamindar and to the ryot, the only satisfactory means of doing so, in the absence of existing rates, would be actual investigation and experiment on the fields themselves—a method precluded by the summary nature of the enquiry contemplated by Government.

Extract from a letter from BABOO PARHATI CHURN ROY, on special duty, to the Secretary to the Board of Revenue, Lower Provinces, No. 86, dated the 24th January 1883.

PARA 6.—The following tables, A and B, show the results of the experiments made at husking. In table A is given the result of the experiments made for obtaining the atap rice, and in table B that for obtaining the ushna from the paddy. Two experiments were made for obtaining the atap rice, and four for obtaining the ushna. All the experiments were made in my presence, and in a most careful manner. The husking was done before my very door, and the weighing and measuring were done invariably in my presence. The atap rice is obtained by husking the paddy simply dried in the sun, while the ushna is obtained from paddy that is first steeped in water and heated over a fireplace. It is then dried in the sun before being husked.

The atap is not the rice in ordinary use among the people. As a rule it is used only by the widows of the higher castes. It is considered to be much purer than the ushna, and is hence also used in the worship of the Hindu gods and goddesses. The cleansing of the paddy to obtain this sort of rice takes up more time than that to obtain the ushna. The proportion of atap rice obtained per maund is 27 seers 11 chittacks, which is about a seer less than that obtained, 28 seers 6 chittacks, of the ushna.

It will be seen that, while the quantity of husks or chaff obtained in either way is nearly the same, the quantity of fine dusts from the inner coating is greater in the case of atap than in that of ushna. The reason of it is that in undergoing the process of cleansing, the atap rice is beaten more than the ushna, and hence it gives out more dust from its inner coating than the ushna. These fine dusts, called *koarak*, are eaten by the cattle with relish.

Equal weights of atap and ushna are to one another in bulk as 39 is to 40.

A comparison of the results of the experiments made by me with those recorded at page 290 of the Statistical Reporter, show that, on the whole, the results of both the experiments are the same. The small difference of about $\frac{1}{2}$ seer between the average of the two sets of experiments might be owing to the different sorts of rice experimented upon. The experiments made by me have been with the ordinary rice, which is rather coarse, while those made by Mr. Larymore seem to have been generally with the finer species. Mr. Larymore also does not state whether he obtained the atap or the ushna rice: very probably he obtained only the latter.

In bulk, it will be observed, the atap rice bears to the paddy a larger ratio than the ushna does. This is what was expected in consequence of the paddy being steeped in water and heated in making the ushna rice, which has the effect of increasing the bulk of the husk much more than that of the rice.

TABLE A.

Showing the result of two experiments made for obtaining Atap Rice, i.e., rice obtained by husking paddy simply dried in the sun.

Number of experiments.	Quantity of paddy.	Quantity of rice obtained.		Quantity of chaff.		Quantity of rice dust obtained.		Wastage.		Ratio of rice to paddy by weight.	Ratio of rice to paddy by bulk.
		Srs.	Chs.	Srs.	Chs.	Srs.	Chs.	Srs.	Chs.		
1	Maunds. 1	27	11	9	9	2	7	0	11	60	54
2	1	27	4	9	9	2	8	0	11	58	53
Average per maund		27	9	9	4	2	7½	0	11	63	54

TABLE B.

Showing the result of experiments made for obtaining Ushna Rice, i.e., rice obtained first heating paddy steeped in water, and then drying it in the sun previous to husking.

Number of experiments	Quantity of paddy		Quantity of rice obtained		Quantity of chaff		Quantity of rice dust obtained		Wastage		Ratio of rice to paddy by weight	Ratio of rice to paddy by bulk	Remarks
	Mds	lbs	Sec	lbs	Sec	lbs	Sec	lbs	Sec	lbs			
1	1	36	1	12	1	0	0	0	0	10	70	51	The ratio of rice to paddy in bulk given in the last column, is obtained from paddy given to be husked after being steeped and dried. The ratio of rice to paddy before the latter was steeped is 57.
2	1	36	0	0	0	0	1	2	0	12	71	54	
3	1	36	0	0	0	0	0	0	0	19	71	49	
4	1	36	0	0	0	0	1	0	0	11	71	50	
Average per mouad		36	0	0	0	11	1	3	0	13	71	50	

PARA. 7.—I have called for jummaabundis and other papers from the zamindars of the estates included in the selected area. As yet no papers have been filed. It is said that most of the zamindars in this part of the country have no jummaabundis, and that all that they have is the jummaabundis of the kind filed by the Nabab regarding Gopibalthpore. But I cannot pass any opinion on the nature of the papers they possess until I see them. The zamindars are not likely to produce papers easily, as they fear lest the fact of their not being in possession of jummaabundis might go against them in future.

No 1827-848 L. R., dated 13th July 1883.

From—C. W. BORTON, Esq., Under-Secretary to Government, Bengal,
To—Secretary to Government of India, Legislative Department

I AM directed to submit, for the information of His Excellency the Governor General in Council, the accompanying copies of the reports received up to date from some of the Judicial and Revenue officers in Bengal, containing expressions of their views on the provisions of the Bengal Tenancy Bill, and to state that a general report on the subject by this Government will follow in due course.

- * 1. From the Commissioner of Bhagalpur, No 1097R., dated the 20th June 1883, with enclosures.
- 2. From the Officiating Registrar of the High Court, Calcutta, No 1835, dated the 27th idem, with enclosures.

No. 1097R., dated Bhagalpur, the 20th June 1883.

From—G. N. BARLOW, Esq., C.S.I., Commr. of the Bhagalpur Divn. and Southal Pergunnahs.
To—The Secretary to the Board of Revenue, Lower Provinces.

In reply to your No. 351A, dated 29th March last, I have the honour to submit the report called for upon the Bengal Tenancy Bill. It is in the shape of minutes of the proceedings of a meeting of the Collectors of the Regulation Districts of this Division and myself, together with separate notes by the Collectors of Bhagalpur and Maldah.

Minutes of the Proceedings of a Meeting held at Bhagalpur on 11th and 12th June 1883, to consider the Bengal Tenancy Bill, 1881.

PRESENT:

G. N. BARLOW, Esq., C.S.I., Commissioner of Bhagalpur, President.
W. H. D'OTLY, Esq., Collector of Bhagalpur.
C. F. WORSLEY, Esq., Collector of Monghyr.
A. WEEKES, Esq., Collector of Purneah.
B. PORCH, Esq., Collector of Maldah.

CHAPTER I.

The definitions and rules contained in this chapter were carefully considered, and it was unanimously agreed that no alteration in them was required.

CHAPTER II

Section 5.—It appeared that the effect of this section, as it stands at present, would be to convert into "khamar" all waste lands which, for twelve continuous years before the commencement of this Act, "might have been held by the proprietor in his own possession, and that such a result would be in direct opposition to the general principles and intention of the Bill. It was therefore unanimously agreed to recommend the substitution of the word 'cultivated' for the word 'held' in clause 1, and the addition of the words 'whether with his own stock, or by his servants, or by hired labour.' The meeting was fully aware that the effect of this amendment, if adopted, would be to make all waste lands "ryoti," but was of

opinion that this was preferable to the former course. It was also unanimously agreed that, as the word "zeraut" is unknown in certain parts of the Bhagulpoore Division, which are included in Behar, and as "kamut" is used in such parts in the same sense that "zeraut" bears elsewhere, the words "or kamut" ought to be inserted in clause 2 (a) and (b) after the word "zeraut."

Section 8.—It was observed that the Bill makes no provision for meeting the expenses of making surveys, unless power for that purpose is conferred on the local Government by authorising it to prescribe rules "for the conduct of such surveys." It was thought that, if the Government did not intend to defray these expenses, it should be made perfectly clear that the expression "conduct of such surveys" includes the "apportionment and recovery of expenses."

CHAPTER III.

Section 18.—Objection was taken to clause (1) (a) of this section on the grounds that recognition "of the special custom of the district" would promote litigation and false swearing by tempting zemindars to make innovations, and to describe them as existing special customs, and that crafty zemindars would persuade ignorant tenure-holders to accept reductions of rent in years of scarcity, and would thus destroy the character of their tenures. It was unanimously agreed to recommend the elision of clause (b), and the amendment of clause (1) (a) by inserting after the words "except on proof" the words "of liability to enhancement by the conditions under which the tenure is held." It was noted that in the event of this proposed amendment being adopted, it would be necessary to substitute the words "shall not be deemed a change of rent" for the last words of clause (2).

Section 32.—It was not understood on what principle a tenure-holder, who had failed for more than six months to make application for registration of a voluntary transfer of, or succession to, a permanent tenure, was required to pay "a fee of 20 per centum upon the annual rent of the tenure," &c., under section 27, clause (2), (b), while the zemindar who had refused, on insufficient grounds, to comply with an application, made as required by clause (1), could only be compelled by the civil court to grant registration. Having regard to the annoyances and expenses entailed by litigation, and to the requirements of ordinary justice, the meeting was of opinion that the following addition ought to be made to clause (3):—"In such case the court shall award costs to the transferee and special damages, at the rate of 20 per centum upon the annual rent of the tenure, provided that such damages shall not be less than ten rupees, or more than one thousand rupees."

CHAPTER V.

Section 47.—It was thought that, reading section 3 (b), and section 4 (g), illustration with sections 45 (1) and 47, it was not the intention of the Bill that an under-tenant should ordinarily be able to acquire a right of occupancy, but that ■ any doubt could possibly be entertained on this point from the wording of the two sections last mentioned, it ought to be removed.

Section 51.—In view of the notorious delays which occur in the serving of notices, it was unanimously agreed that for the words "he files the notice" at the end of clause (1), the words "the notice hereinafter mentioned is served on the zemindar" ought to be substituted, and that for the same reason the word "filed" should be replaced by the word "served" in clause (3). With reference to clause (4) it was unanimously agreed that "sales" made in contravention of the conditions prescribed in the preceding clauses ought to be pronounced null and void as having been made in violation of the law, and that it is unfair to make the landlord's right of interference contingent on his obtaining information of an illegal sale within six months from the date thereof.

Section 53.—To prevent fraudulent and collusive mortgages, it was unanimously agreed that after the words "redeem the mortgage" in clause (2), the following words ought to be added:—"or if such amount be considered by the civil court, on an application made by the landlord, to be in excess of the value of the holding, such sum as, in the opinion of the court, may be the fair value of the holding."

Section 54.—For the reasons previously given under section 51, it was unanimously agreed that the word "served" ought to be substituted for the word "filed" in clause (3), and that a gift made in contravention of clauses (1), (2), and (3) should be declared null and void in clause (4).

Section 56.—It was observed by the meeting that although at different times, and by different objectors, it had been urged that if an occupancy right were made transferable by law, zemindars or planters, or the mahajans, would buy up occupancy rights on a great scale; yet, on zemindars alone had been imposed the condition contained in this section. It appeared to the meeting that there was no sufficient reason for making such a distinction in any case where the landlord had executed and registered an instrument under clause (1) (b) of section 141, and the fact that, in the event of his estate being sold for arrears of revenue under Act XI, 1850, such a zemindar would (but for this section) at once become an ordinary occupancy ryot, with respect to those holdings which he had previously purchased, seemed a conclusive argument against the proposed restriction. Accordingly, section ■ was unanimously condemned by the meeting.

CHAPTER VI.

Part B.—It was agreed (Mr. Porch alone dissenting) that this part ought to be entirely omitted. The reasons on which the majority of the meeting came to this opinion were as follow :—

- (1) The difficulty or impossibility of ascertaining rates in the way proposed.
- (2) The necessity that would still exist, even if a table of rates were prepared and sanctioned for any area, of holding a local enquiry in each case for enhancement of rent in order to identify the class under which each field in the holding would fall.
- (3) The want of proper establishments and experienced or scientific officers to classify the lands.
- (4) The cost of making a local enquiry in each case.

The majority were further of opinion that a zemindar who does his duty by his land and ryots should have little difficulty in ascertaining approximately the average gross produce of every holding in his estate.

Section 78.—The meeting while heartily approving of this section, unanimously agreed that it does not go quite far enough, and that a landlord who has failed in a suit to obtain a decree for enhancement of rent, ought not to be allowed to bring another enhancement suit against the same holding for a period of five years. The meeting feared that there is nothing in the law to prevent a rich and powerful zemindar from bringing a vexatious suit in each year of a decade against a poor ryot, to whom it is only less costly and grievous to win a civil suit than it is to lose one.

CHAPTER VII.

Section 93.—There appearing to be some doubt whether clause (2), (a) is sufficiently explicit, it was unanimously agreed that, after the word "improvements," the words "made by such ryot in accordance with the Act" ought to be added.

It was further agreed (Mr. Worsley alone dissenting) that clause (b) ought to be struck out as being unfair upon the landlord.

CHAPTER IX.

Section 96.—It was unanimously agreed that an occupancy ryot ought not to be compelled to take up land added to the area of his holding, and that he should only be liable to pay additional rent for such land if he wishes to use it.

Section 100.—Reading this section with sections 189 and 229, meeting felt some doubt whether the acts here required to be done by the landlord may be performed on his behalf by a naib or gomastah, and considering the serious penalty that may be incurred by a landlord under clause (4), it was unanimously of opinion that while it would be hard on the zemindar to require him personally to grant receipts for rent, it would be unsafe to leave this duty, as it now is often left, in the hands of the putwarree. It was therefore unanimously agreed that the words "or legally constituted agent" ought to be added after the word "landlord." These remarks apply *mutatis mutandis* to sections 101 and 102, the zemindar being still held liable for his agent's omissions or irregularities.

Section 100.—It was unanimously agreed that any application for payment of a deposit ought to be exempted from stamp duty.

Section 114.—The meeting failed to see why a division of produce should be liable to be questioned in the civil court any more than an estimate or appraisal of a crop, the Collector's orders in the latter case being expressly declared final by section 115, clause (2), and was further of opinion that unless the proceedings of the revenue authorities are in every respect made final, it will be inexpedient to confer on them any jurisdiction at all.

CHAPTER X.

Sections 127 (2) and 128 (2).—Having regard to the state of relations generally between landlords and tenants in Behar, and to the possibility of works being undertaken without sufficient grounds, or for the purpose of causing annoyance, it was unanimously agreed that in the event of a difference of opinion arising between a landlord and tenant as to the utility of a proposed work (section 126), some provision is required for a summary determination of the question by the civil court or revenue authorities.

Section 132.—It was unanimously agreed that clauses (2) and (3) ought to be struck out, and that in clause (1) the Collector's decision ought to be declared final.

CHAPTER XII.

Section 164.—It was observed that in cases other than those mentioned in clause (2) (a), no provision had been made for payment of expenses incurred under this Chapter. In the opinion of the meeting a section similar to section 163 was required.

CHAPTER XIII.

It was unanimously agreed that in view of the expense of initiating distraint, and of the difficulties of efficiently carrying out distraints in its new form, it is desirable to abolish the process altogether. It was believed that if the provisions do not become a dead letter by reason of the heavy initial expense of the distraint proceedings, the civil courts will be unable

to deal with numerous applications, and that, whether applications be many or few, the officers, *i.e.*, common peons, deputed by the court to make dextrant, cannot be trusted to act honestly.

CHAPTER XIV.

It was unanimously agreed that in suits for arrears of rent, which involve no questions of right or title, and in which the only point for determination is the payment or non-payment of the rent, the procedure of the civil court in regard to the recording of evidence, &c., ought to be made as summary as is the procedure of Magistrates in summary criminal trials.

The meeting having no further proposals to make, was dissolved on the evening of 12th instant.

1. (Sd.) G. N. BARLOW.
2. (Sd.) W. HASTING D'OILY.
3. (Sd.) C. F. WORSLEY.
4. (Sd.) A. WEEKES.
5. (Sd.) R. PORCH.

The 13th June 1883.

Memorandum of a few points on which I dissented from the opinions of the majority of the Bhawalpur Districtal Committee, which met to consider the provisions of the Bengal Tenancy Bill, on 11th and 12th June 1883.

CHAPTER I.

Section 3 (5).—According to the wording of this clause, a ryot would no longer be deemed to be a ryot, should he use or sublet his land for any purpose other than one of agriculture, horticulture, or pasture. If, therefore, a ryot should, with the zemindar's consent, use his land, or sublet it for the purpose of brick-making, for the manufacture of saltpetre, or pottery, for extraction of kunker, or for any other purpose than those named in the clause in question, would he cease to be deemed a ryot? Would the relations between him and the person under whom he held the land cease to be the relations between tenant and landlord? If he cease to be a ryot, he loses his right of occupancy. Section 230 certainly allows the recovery of anything payable or deliverable in respect of any rights of pasturage, forest rights, rights over fisheries, and the like, but would this cover the rent of land used for all purposes other than those of agriculture, horticulture, or pasture?

CHAPTER III.

Section 15.—While agreeing with the rest of the Committee that clause 1 (b) should be struck out, I think clause 1 (a) should be retained, with only this modification that the word "locality" should be substituted for the word "district."

CHAPTER V.

Section 40.—I think an exception should be made in favor of settled ryots whose holdings may be cut away by diluvion. In many parts of the country it is the custom to re-instate ryots whose holdings have been cut away by a river, so soon as re-formation *in situ* occur. The Committee seemed to be of opinion, when I raised this question, that as such ryots could retain their rights by continuing to pay rents till their lands should re-form, no further protection was necessary. In this view I differ. It is manifestly absurd to compare zemindars with ryots. A zemindar whose title has been cut away by a river can generally afford to go on paying the Government revenue till a re-formation *in situ* occur; but how many ryots could afford to continue paying rents for lands not in existence?

CHAPTER VI.

Sections 76, 77, 78.—Some exception should, I think, be made in respect of recently reclaimed lands. For example, after the passing of this Bill into law, a zemindar A wishes to get from his ryot B a fair rent for his holding. B has held this land as a ryot for, say, four or five years, at first rent-free, latterly on payment of a nominal rent of two annas per bigah, a concession granted to compensate B for the cost of clearance, &c. Should this Bill pass into law, the zemindar A can enhance the rent; but under the terms of section 76 the enhanced rent cannot be more than at a rate of four annas a bigah, *i.e.*, double of the rent

Year.	Rent. Rs. As.
1884	0 4
1894	0 8
1904	1 0
1914	2 0
1924	3 0

previously paid; and by the terms of section 78 this rate of four annas per bigah cannot be raised for ten years, when it can be raised to eight annas per bigah, and after another ten years it can be raised to one rupee per bigah, and so on. Thus, supposing the land in, say, 1884 A. D. is equal to lands for which three rupees per bigah is paid as rent, the landlord will have to wait for 50* years before he can legally recover

fair rent!!! These remarks apply also to the provisions of section 69 (2).

CHAPTER VII.

Section 82.—I certainly think that the *zemindar* should also have the power to sue for the commutation of rents paid in kind into a money rent. When I was Collector of Shahabad, Mr. Walter Thompson of Beheea, who was justly considered to be a very fair and, indeed, a model landlord, told me that he had always found that "*bhowli*" lands were worse cultivated than those for which a money rent was payable. The cultivator of *bhowli* lands is not under the necessity of doing his best to secure an yield that would pay a money rent of, say, Rs. 3, Rs. 4, or Rs. 5, a bigah, and leave him something over. He is sure of half the produce, and will not be liable for any rent beyond the other half of the produce. It may be argued that every ryot will try and make as much out of his land as he can, but those who have really looked into the matter, who have made close enquiries, will find, as I have done, that very many of the ryots will not take the trouble to get all they can out of the land. There are good cultivators and bad cultivators, and the latter predominate, and among them generally are to be found those who pay rents in kind. I will give as an instance one out of very many cases of the kind which come under my observation in this district. I was making enquiries as to rates of rent, yield of produce, &c. I found very unequal yields even in lands of the same quality, the same soil, the same level, with equal advantages. In one particular field I found a very fine crop of rice, which in the next the crop was a remarkably poor one. Both fields belonged to one and the same ryot. The soil was the same in both, the facilities for irrigation were equal, and neither had an advantage which the other lacked. I questioned the ryot, and found that he had some 30 bigahs of land. Of these six or ten bigahs at the most were well cultivated, and were returning a good yield, the rest were comparatively poor. He told me that he could not bestow the same care and attention on all, so he did all he knew with as much of the land as he could, the produce would pay the rent of the whole 30 bigahs, and he could take what God gave him out of the remaining 20 bigahs; he simply sowed them broadcast and trusted to the rainfall. He had lands for which he paid a money rent, as well as lands for which he paid rent in kind, the latter were not the best cultivated. Why should the zemindar, I ask, be prohibited from getting a fair money rent if he wishes. Why should an idle ryot be allowed to hold lands on the payment-in-kind system, when he does not attempt to get the best return he can out of them. For my part, I should be very glad if large ryoti holdings could be reduced; if occupancy rights could be restricted to the actual cultivators.

CHAPTER VIII.

Section 85 (2).—I am very much afraid that it will be found in time that the effect of this section will be that in some villages all or a great portion of the *bastu* lands will belong to persons other than the cultivators. Then where is a zemindar to find house-lands for his ryots?

Section 95.—To this the remarks apply, which I have made under sections 76, 77, 78, Chapter VI.

CHAPTER IX.

Section 125 (2).—This is admirable so far as it goes, but it will not protect the zemindar's claim if the tenant's right be sold for less than the amount of rent owing, as might be the case, if the tenant owes three years' rents. I think the transferee should be made liable for any legally recoverable arrears not covered by the purchase-money, for he will have obtained the holding at less than three years' purchase, and it is a known fact that properties at public sale have fetched far below their proper value. The land should be the security for the rent, and when it is sold, it should be sold with the incumbrance of any rent due thereon. The right of pre-emption in such a case would not be sufficient; the zemindar would have to buy the right, and even granting that he might recover the price from a new tenant by way of *salami* or *nuzzur*, still he would have to give up the arrear rents as a bad debt. All that this proposal would effect would be the prevention of a sale of an occupancy right at less than three years' purchase.

CHAPTER XIII.

I think that the resolution of the Committee has not been quite correctly worded, as I understand we did not agree that it was desirable that this chapter should be eliminated, but that in its present form it would give no real advantages to landlords, and that, therefore, it would be preferable to eliminate it, rather than keep it in its present form. I myself think that the zemindars should have power to distrain through the courts, but I think that where a zemindar wishes to distrain the crops of several ryots in one village, he might be allowed to sue them collectively.

To have to put in many separate petitions, to examine the same witness in each case would make the procedure cumbrous and very expensive, both to the zemindar and also to the ryots. It has been openly asserted that one of the objects of the present legislation is to afford facilities to the landlord for the settlement and recovery of his rent, whereas there can be but little doubt that the recovery of rent has been made more difficult than it previously was. I do not advocate the retention of the provisions of the present law of distraint, but I think that the provisions proposed in the Bill should be made more workable and less calculated to make recovery expensive both to landlord and tenant.

BHAGULPORE,
The 17th June 1883.

W. H. DOYLE.

Note on right of occupancy, Chapter I, section 50—Right of occupancy made transferable.

I approve of the principle of transferability of the occupancy right, and therefore have agreed to it in the report, but would like to see this incident gradually developed by extension under the order of the local Government, because in some parts of Bengal, when enacted, it will at once lead to a very general loss of these rights of occupancy holdings by the present generation of ryots, whose holdings will be at once bought up by the money-lending classes, and will pass into their hands, the ryots becoming rack-rented pauper-cothens, or landless labourers. I would, therefore, like to see this extension of this incident of the right of occupancy holding made permissive, and depending on the discretion of the local Government to extend this to any village, estate, pergunnah, thana, or other division of the country to which it may be found proper, with regard to the solvency, independence, and enlightenment of the ryots, *viz.*, to extend these provisions by notice in the *Calcutta Gazette*, until which time the rights under section 50 (*f*), and the provisions regarding transferability and private sale and gift should remain in abeyance and inoperative, namely, 50 (*f*) and sections 51 and 54, and in lieu of the above, the following should be enacted as the extent of transferability to be at once recognised everywhere as operative until by notice in the *Calcutta Gazette*, the fuller provisions as to transferability, sections 50, 51, and 54, may be extended where found proper.

Section 50 (f)—“His interest in the land is transferable by sale on account of its own arrears, and not otherwise, except with the consent of the landlord. He shall have the option of forcing a sale of such interest if the landlord refuses to consent to a private sale falling into arrears, and thereby allowing the occupancy ryot, by the sale for arrears, to recover all money spent in improvements of the same, and the landlord to have a lien on the purchase-money for recovery of any arrears due on the same, or such sale not to take place until all arrears due on the occupancy holding are paid, or otherwise secured to the landlord. *It should also be enacted* that, when transferability of the occupancy holding by private sale is extended, the landlord should be, under severe penalties, prohibited from compelling the occupancy ryot to share the purchase-money with him. In Eastern Bengal I have known the landlord compel an outgoing occupancy ryot to pay him from half to two-thirds of the purchase-money paid for the occupancy holding. The transferability by the private sale, &c., might probably now, with safety as to the ryots' interest, be extended to the Chittagong and Dacca and Presidency Divisions, and to all Court of Wards' estates and properties under the direct management of Government, and afterwards to various parts of other divisions. At the next revision of the law the permissive section might be dispensed with.

Note on Chapter VI of the rent payable by occupancy ryots (A) of money rents generally.

In order to prevent any interference with the custom of giving lands rent-free for a time, and with progressive rents to recomp outlay for bringing waste lands or newly formed lands into cultivation, or of creating other speculative holdings of new land or diyara land, I would add as follows to section 53.—

Exception.—Nothing in this Act shall release an occupancy ryot from liability to pay the enhancements under an engagement to pay a progressive rent for lands that are being newly brought under cultivation, provided that the rent for any year should not exceed the fixed legal maximum rent, *viz.*, one-fifth of the estimated average annual value of the gross produce of the land in staple crops, calculated at the price at which ryots sell at the usual time of realizing their staple crops in money.

Regarding Chapter VI, Part B.

I am aware of the difficulties attending this scheme as to preparing a table of rates, and perceive that in case of suits for enhancement of rent, such tables of rates could not be relied on ordinarily, as conclusive of the fairness of the rate of enhancement claimed, and that careful local enquiry would still be necessary to enable a proper judicial decision to be arrived at in an enhancement case, still I should like to see a trial given to these provisions. Where there are large estates under the Court of Wards, and large khas mehals under Government and well managed private zemindars, very useful local table of rates of rents might be prepared for the information of the public, and for the general guidance of those concerned in regulating and fairly adjusting rates of rent, and in land management and for general agricultural purposes, which would be found to facilitate the objects and the working of this Act. For these reasons I would give them a trial, and would not now strike them out of the draft Bill.

Regarding Chapter X (b), Sections 133 to 138—Measurement.

I should like to see an addition to this effect—

Exception.—Nothing in this Act shall interfere (1) with the customary periodical measurements of hâl hâsila, utlandi and diyara and other lands, the settlement of the rents of which depends upon the measurement of the lands so cultivated, or (2) with the ryots' right to obtain measurement of his holding for reduction of rent whenever necessary from diminution of holding, from diluvion or otherwise.

MALDAH,
The 18th June 1883.

R. PORCH,
Collector.

No. 1835, dated Calcutta, the 27th June, 1883.

From—C. A. WILKINS, Esq., Offg. Regr. of the High Court of Judicature at Fort William in Bengal,
To—The Secretary to the Government of Bengal, Revenue Department.

I am directed to acknowledge the receipt of Mr. Bayley's letter No. 975—374L.R.,

dated the 19th of March last, forwarding, for an expression of the Court's opinion, as well as the views of the chief judicial officers under the control of the High Court, a copy of the Bengal Tenancy Bill, 1883, together with Statement of Objects and Reasons.

2. In reply, I am to forward, for the information of His Honor the Lieutenant-Governor, the accompanying reports which have been received from some of the District Judges and Subordinate Judges who were asked for their views on the Bill. The reports still due will be forwarded when received.

3. I am to add that none of the Judges

J. F. Stevens, Esq., District Judge, Saran.
W. F. Mercer, Esq., District Judge, Midnapore.
J. F. Bradbury, Esq., District Judge, Buckerganga.
A. C. Brett, Esq., District Judge, Tihoot.
C. B. Garrett, Esq., Officiating District Judge, 21-Pergunnahs.
R. Towers, Esq., District Judge, Tipperah.
Baboo Brojendra Kumar Seal, District Judge, Bankura.
Baboo Mohendronath Bose, Small Cause Court Judge, Sealdah.
Baboo Amrita Lal Chatterjee, Subordinate Judge, Nudda.
Baboo Mohendronath Mitter, Judge, Small Cause Court, Moorshedabad.
Baboo Bhugwan Chunder Chakraborty, Subordinate Judge, Khulna.
Moulvi Syed Muzam Hassan, Judge, Small Cause Court, Magoorah, Jhendsah, and Nurel.
Baboo Nuffer Chunder Bhattacha, First Subordinate Judge, 21-Pergunnahs.

of the High Court have as yet sent their opinions on the Bill to the Government of India.

No. 200, dated Chapra, the 14th May, 1883.

From—J. F. STEVENS, Esq., Officiating District Judge, Saran.

To—The Registrar of the High Court of Judicature at Fort William in Bengal.

In accordance with the directions of the Court in letter No. 1157B, dated the 23rd ultimo, I have the honor to submit the following report, after consulting Baboo Kally Prosono Mookerjee, First Subordinate Judge, Baboo Amrita Lal Pal, Second Subordinate Judge, and Baboo Krishna Chunder Das, Munaf in charge of rent suits.

2. I regret that the shortness of the time allowed me for my reply has rendered it impossible for me to devote to the subject the time and the amount of consideration which I could have wished.

3. It is obvious that in general the Bengal Tenancy Bill, 1883, has been framed with a view rather to the interest of the raiyats than to that of the landlords. It is doubtless true that to a considerable extent the interest of the rayats and that of the landlords are really in the long run not so completely separate as is frequently assumed; but while I recognise this principle, and I am not disposed to agree with my subordinates in condemning all limitation to the enormous arbitrary powers which the landlords at present can and do exercise, especially in certain parts of the province of Behar, I am inclined to think that in some particulars the Bill goes further in that direction than is either necessary or desirable.

4. I proceed to notice the provisions of the Bill in order.

CHAPTER I.

5. I think that an attempt should be made to define the terms "tenure" and "under-tenure." In Chapter III of the Bill, we find important provisions on the subject of tenures, but when we turn to the definition in order to ascertain what a tenure is, we only find that it "includes an under-tenure (which term is left altogether undefined), and the interest of every tenant of the class referred to in section 14." There is no definition of the term "under-tenure." The word "tenant" also does not appear to be satisfactorily defined.

CHAPTER II.

6. I strongly approve of the provisions for ascertaining and registering *khamar* land. I think that it is fair, in the peculiar circumstances with which we have to deal, to presume all land to be *raiya* until the contrary is proved. I am decidedly in favour of limiting the power of the landlord to convert *raiya* land into *khamar*; but I venture to think that the Bill goes too far in absolutely preventing the increase of the stock of *khamar* in future. I do not, for example, see why a landlord should be prevented from acquiring as *khamar* uncultivated land which he brings under cultivation by his servants or by hired labourers. It might be provided that no *raiya* land now under cultivation should hereafter be converted to *khamar*; but that is the furthest that I would go. In any case of increase of *khamar*, I would provide that in any district, or part of a district, in which a survey and register of *khamar* land has been made, or ordered to be made, in accordance with the provisions of section 7, the landlord should be bound to register any land which might thereafter become *khamar*.

CHAPTER III.

7. All the provisions of this chapter seem to me just. I am not quite clear, however, as to the working of section 27 (3) and section 34, looking to the definition of the word "landlord" as "a person or a number of persons," &c. Is each individual, who goes to make up the